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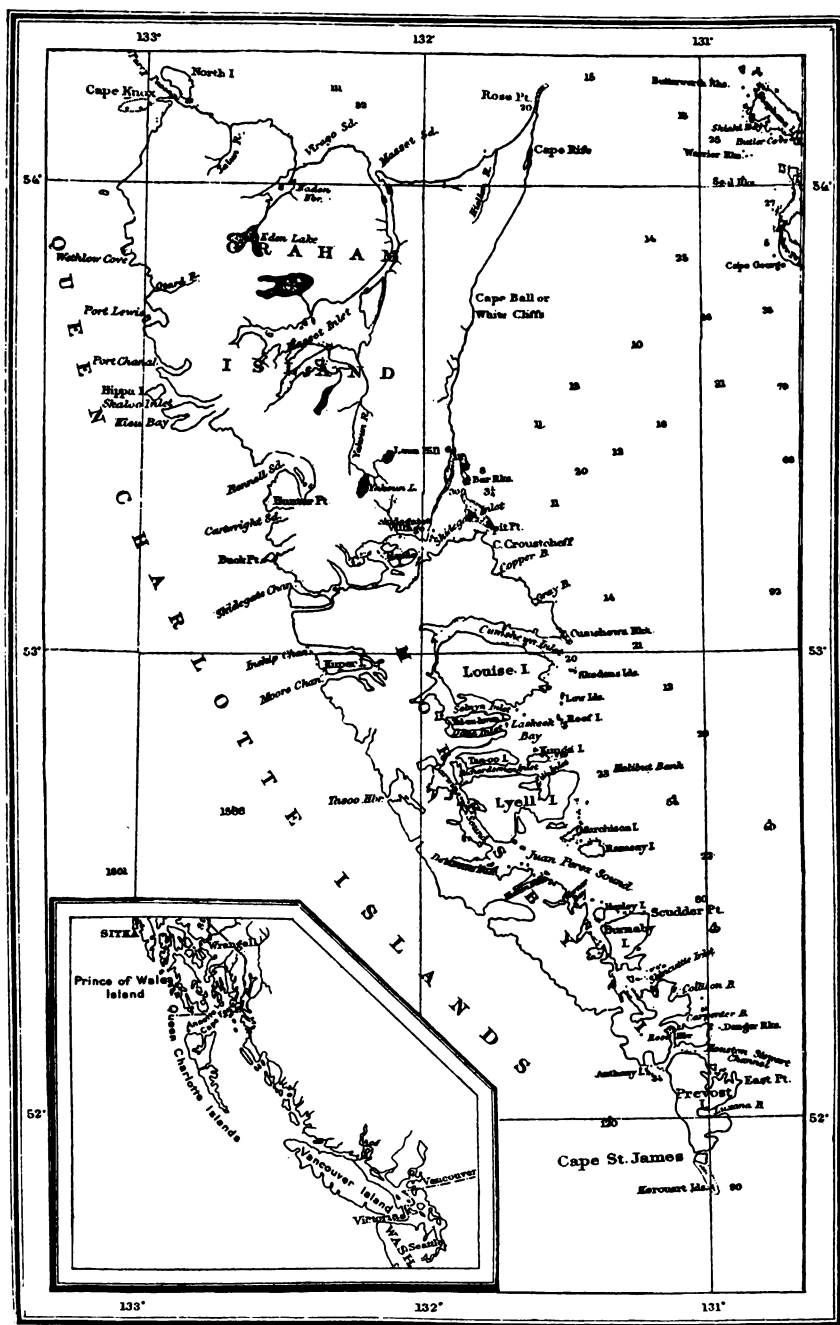
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MAP OF THE QUEEN CHARLOTTE ISLANDS.

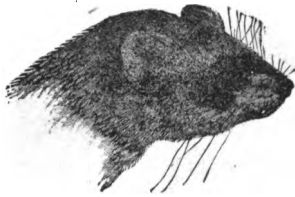
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U. S. DEPARTMENT OF AGRICULTURE
DIVISION OF BIOLOGICAL SURVEY

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NATURAL HISTORY OF THE QUEEN CHARLOTTE ISLANDS, BRITISH COLUMBIA
NATURAL HISTORY OF THE COOK INLET REGION, ALASKA

BY

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WASHINGTON
GOVERNMENT PRINTING OFFICE
1901

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
Washington, D. C., July 5, 1901.

SIR: I have the honor to transmit herewith for publication, as No. 21 of North American Fauna, two special reports on the natural history of little-known parts of the northwest coast of North America, the Queen Charlotte Islands, British Columbia, and Cook Inlet, Alaska, both by my assistant, Wilfred H. Osgood.

Owing to the absence of definite information concerning the faunas of these areas, Mr. Osgood was sent there to conduct biological explorations during the field season of 1900. The results of his trip form an important contribution to the natural history of the northwest coast region.

Respectfully,

C. HART MERRIAM,
Chief, Biological Survey.

Hon. JAMES WILSON,
Secretary of Agriculture.

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NATURAL HISTORY OF THE QUEEN CHARLOTTE ISLANDS.

By WILFRED H. OSGOOD,

Assistant Biologist, Biological Survey.

INTRODUCTION AND ITINERARY.

The Queen Charlotte Islands lie off the coast of British Columbia, just south of the Alaskan boundary, between latitude $51^{\circ} 55' N.$ and $54^{\circ} 15' N.$ They are slightly farther from the mainland than any of the islands of the Alexander Archipelago, to the north of them, and are not in the track of regular coasting steamers. They were visited by several of the early navigators of the northwest coast, but until 1787 no name was given them and no account of them had been published. In this year Capt. George Dixon cruised about the islands from July 1 to August 3, trading with the natives and roughly charting the coast. He named the group after Queen Charlotte, the consort of George III of England, and in the report of his voyage which appeared later included a very interesting account of his visit, together with maps and illustrations. In the early part of the nineteenth century various fur-trading vessels stopped frequently at the Queen Charlottes, and later the discovery of gold and coal in small quantities has caused sporadic invasions by prospectors. No important attempt has been made, however, to develop the resources of the islands.

The interior has not been explored to any great extent, and probably will not be for some time to come, since the difficulties of travel are insurmountable to ordinary expeditions. The principal harbors and most of the east coast have been surveyed from time to time by officers of the royal navy, and the late Dr. George M. Dawson spent the summer of 1878 in studying the geology and littoral topography of the group. The report¹ that he published is exceedingly interesting and important. It contains accounts of the history, geology, and ethnology of the islands, with some notes on the natural history, more especially of invertebrates. The vertebrate fauna as a whole had never been studied until the present year, however, and the little that was known of it was entirely due to the zeal of Rev. J. H. Keen, who for

¹Geol. Survey of Canada, Report of Progress for 1878-79, Pt. III, pp. 1-239, Montreal, 1880.

eight years was engaged in missionary work at Massett. The present white population consists of several missionaries and three or four other men, who are engaged in trading and fishing. To supply necessities to these and to carry mail to them and the educated natives, small steamers make irregular trips to the islands.

From one of these steamers I was landed June 13, 1900, with my assistant, Mr. Edmund Heller, at the fishing station in Cumshewa Inlet, known as Clew (also spelled Klue), on the north side of the inlet about 10 miles from its mouth. We were very kindly received by Mr. W. H. Dempster, who conducts a plant here for obtaining oil from the dogfish which abound in the waters about the islands. We made small collections at Clew, and then devoted a number of days to cruising about the inlet in a canoe, collecting and making observations at various points. The first and most important trip was to the head of West Arm of Cumshewa Inlet, where we camped from June 17 to 25. After the coast at this point had been worked an expedition was made to the top of the highest mountain near the head of West Arm.¹ This trip was exceedingly trying, as we were obliged to carry food, bedding, and traps on our backs and beat our way through the deep forest and heavy underbrush. We reached an altitude estimated at 4,500 to 5,000 feet. After working here in the Hudsonian zone as much as possible in the brief time available we returned to Clew, and from there made short trips to Louise Island and the mouth of the inlet. The next move was to Prevost Island, at the south end of the group, which was reached by means of a small fishing schooner. We dropped anchor July 3 in Houston Stewart channel, near Ellen Island, from which point both Prevost Island and the south end of Moresby Island were worked. In a few days we sailed north again and landed at Skidegate July 9. Here work was done about Skidegate Inlet and on the south end of Graham Island until July 18, when the trip was drawn to a close. Our entire time on the islands was thus about five weeks, and we were able to visit the three largest and most important of the group, namely Graham, Moresby, and Prevost. The weather during practically all this time was extremely disagreeable, rain being not only continuous for long periods, but often so severe as to interfere seriously with work. Most of the natives, unfortunately, were away at the time. They find employment in summer at the salmon canneries on the coast, the men being skilled in fishing and the women in packing. They are much reduced in numbers, and the entire population is divided between the two small villages of Massett and Skidegate, though ruins of former villages are abundant on other parts of the islands.

¹ This mountain is indicated, but not named, on the map published by Dawson. The only Indian I was able to interview said it was sometimes called Haida Mountain; but the white men had no name for it, though it is a very conspicuous peak.

ACKNOWLEDGMENTS.

The preparation of this report and the following one has been greatly facilitated by the free access which has been accorded me to the collections of the U. S. National Museum. Mr. Robert Ridgway, curator, and Dr. Charles W. Richmond, assistant curator of birds, have been exceedingly kind, not only in placing at my disposal the collections under their charge, but in numerous other ways as well. I am likewise indebted to Mr. Gerrit S. Miller, jr., assistant curator of mammals, for similar favors from his department. Mr. Joseph Grinnell, of California, has kindly forwarded me specimens for examination from his private collection.

Through the kindness of Rev. J. H. Keen it has been possible to include in the list of birds many migratory and winter resident species. Mr. Keen lived at Massett for eight years, and during that time collected and identified a large number of birds and other animals. He has very generously furnished a list of Massett birds, with notes for use in the present report, giving all the species positively identified by him. Special acknowledgment has been made elsewhere to Mr. Frederick V. Coville and other botanists who have so kindly assisted in the determination of plants (see p. 13).

PHYSIOGRAPHY.

The Queen Charlottes are part of a submerged mountain chain like most of the other large islands of the same coast, and were regarded by Dawson as a continuation northwestward of the ranges of Vancouver Island and the Olympic Peninsula. Their general trend is northwest and southeast, practically parallel with the mainland. The greatest length of the entire group is 156 miles,¹ and the greatest width 52 miles; the area is unknown. The main islands of the group are, consecutively from north to south: North, Graham, Moresby, and Prevost (see frontispiece). All are very closely connected, the width of each intervening channel being reduced, at least at some points, to less than a mile. The shortest distance between the Queen Charlottes and the islands very closely connected with the mainland is 27 miles, from Rose Point, Graham Island, to Stephens Island. The wide channel known as Hecate Strait, which lies between the Queen Charlottes and the mainland, is rather shallow; that part between Graham Island and the mainland seldom exceeds 20 fathoms in depth.

Graham Island is the largest of the group; its greatest length is 67 miles, and its width 52 miles. The coast on the north end is very deeply indented by Massett Inlet, and to a lesser degree by Naden Harbor; on the east side it is comparatively regular, and the west is characterized by deep, unsurveyed sounds. The east side of the island is low

¹ Distances are stated in nautical miles, and on the authority of Dawson

The giant cedar (*Thuja plicata*) is sparingly scattered through the forest in all parts of the islands except the higher mountains. Large individuals were rarely seen near the shore, owing, doubtless, to the fact that for many years the Indians have used the most accessible ones for making canoes.

The yellow cedar (*Chamaecyparis*) is rather rare, except at high elevations. A few individuals of small size were found at the head of West Arm, Cumshewa Inlet, and at the head of Rose Harbor. Dawson found the species in cold places about other inlets of Moresby Island, as well as on the more exposed west coast. And Rev. J. H. Keen reports it in small quantities near Massett. On the mountains of the northern part of Moresby Island it is very abundant, and ranges from an altitude of about 2,000 feet to the upper limit of timber.

The western hemlock (*Tsuga heterophylla*) is probably second in abundance to the spruce, and its distribution, below an altitude of 2,000 feet, is also general. It does not, however, occur in great numbers on the actual shores, like the other conifers, but becomes more abundant inland. The very deepest, darkest forests are largely composed of this hemlock.

The alpine hemlock (*Tsuga mertensiana*) was found only in the mountains near the head of Cumshewa Inlet. It appears with the yellow cedar at an elevation of about 2,000 feet, and soon becoming well established, persists to the highest limit of trees. It is slightly more abundant than the yellow cedar, and with it straggles in fantastic shapes up the ridges or flattens in thick mats on sunny slopes. Now and then it attains fair size and regularity of branching in cold canyons or about small seepage pools in little heather meadows.

The northwest coast pine (*Pinus contorta*) is rather rare. A few small individuals were noticed on rocky detached islets in Skidegate and Cumshewa Inlets and in Houston Stewart Channel; and, curiously, a few very depauperate individuals were found well toward the summit of the mountain near the head of Cumshewa Inlet.

The Pacific yew (*Taxus brevifolia*) was found on Cumshewa Inlet from Clew to the head of West Arm, being most abundant about West Arm. It is quite common around the shores of Prevost Island and the south end of Moresby Island. It is said to occur toward the west coast in Skidegate Inlet, and Rev. J. H. Keen reports that it is not uncommon in some places near Massett. It does not grow to large size and is always found near the shore or on the very edge of the water, which it overhangs at high tide.

The only deciduous trees of importance are alders, willows, and wild crab apples. All are abundant but are somewhat limited to the immediate vicinity of the coast or the borders of streams. The alder (*Alnus oregona*) grows to a relatively large size; individuals from 10 to 15 inches in diameter were frequently seen. The willow (*Salix*



FIG. 1.—MOSS-GROWN SPRUCE, CUMSHEWA INLET.

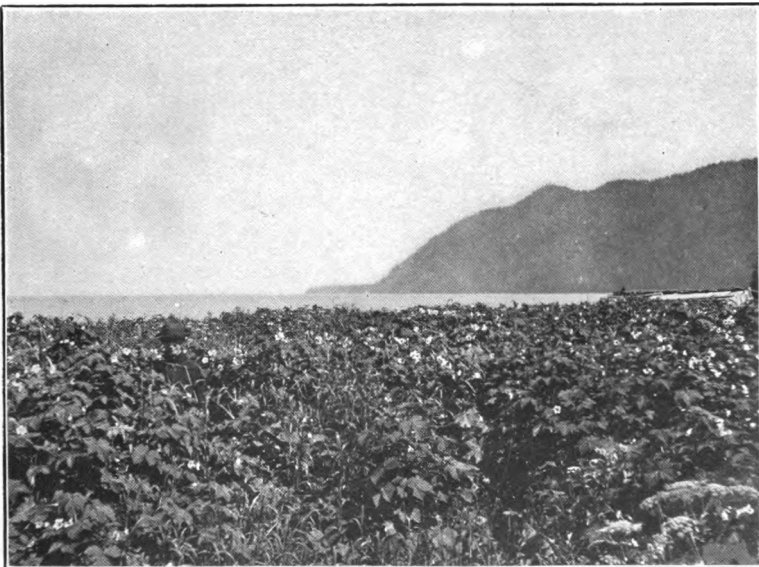


FIG. 2.—SALMONBERRY THICKET, CUMSHEWA INLET.

Habitat of *Melospiza f. rufina*.

scouleriana) is also of fair size and is generally distributed. The Oregon crab apple (*Pyrus rivularis*) is found about streams and along the borders of sandy beaches as well as in occasional open places in the forest, in company with elderberry (*Sambucus racemosus*), dogwood (*Cornus occidentalis*), honeysuckle (*Lonicera involucrata*), and wild currants (*Ribes bracteosum* and *R. laxiflorum*). A hawthorn (*Crataegus brevispina*) also occurs, but evidently is rare, as we found it at but one locality, near a small stream on Louise Island.

The underbrush is largely composed of several species of huckleberry (*Vaccinium*), the sallal (*Gaultheria shallon*), and the salmon berry (*Rubus spectabilis*—see Plate II, fig. 2). *Menziesia*, *Viburnum*, and *Amelanchier* are locally abundant. Throughout the damp forest are many ferns, mosses, liverworts, and numerous species of flowering plants that thrive in such an environment. The few and small open meadows that are occasionally to be found teem with grasses, sedges, buttercups, beach peas, vetches, monkey flowers, thistles, lilies, and large cow parsnips. The flora of the higher parts of the mountains is much like that of similar altitudes on the mainland. As the forest becomes more open the character of the herbaceous plants changes, and numerous pretty glades are found carpeted with heathers (*Phyllo-doce* and *Cassiope*) and sprinkled with dwarf laurel (*Kalmia glauca*), dwarf huckleberries (*Vaccinium cespitosum*), and cowslips (*Caltha palustris*).

Most of our time was devoted to collecting mammals and birds, but a small collection of plants, representing nearly all the species observed was also made. From these specimens the following list has been prepared through the kindness of Mr. Frederick V. Coville, Botanist of the U. S. Department of Agriculture and Honorary Curator of the U. S. National Herbarium. Mr. Coville has not only generously given his own time and that of his assistants to the identification of specimens, but has enlisted the very necessary aid of several eminent specialists, who have authoritatively named specimens in special groups. The liverworts were very kindly determined by Prof. A. W. Evans, of Yale University; the mosses by Prof. J. M. Holzing, of the Minnesota State Normal School, with the exception of the two species of Dicranaceæ, which are given on the authority of Dr. R. H. True; the ferns by Mr. William R. Maxon, of the U. S. National Museum, and the flowering plants by Mr. Frederick V. Coville and Mr. W. F. Wight, of the U. S. National Museum.

Plants.

JUNGERMANNIACEÆ.

Porella navicularis (L. & L.) LINDB.
Radula bolanderi GOTTSCHÉ.
Scapania bolanderi AUST.
Diplophyllaria albicans (L.) TREVIS.
Frullania nisquallensis SULLIV.
Herberta adunca (DICKS.) S. F. GRAY.

DICRANACEÆ.

Dicranum fuscescens TURN.
Dicranella heteromalla SCH.

BRYACEÆ.

Bartramia glaucoviridis C. M. & K.
Mnium glabrescens KINDB.

HYPNACEÆ.

Eurhynchium oregonum (SULLIV.) L. & J.
Isoetecium cardoti KINDB.
Plagiothecium undulatum (L.) SCH.
Hypnum callichroum BRID.
Hylocomium squarrosum (L.) SCH.
Hylocomium loreum (L.) SCH.
Hylocomium splendens (L.) SCH.

POLYPODIACEÆ.

Filix fragilis (L.) UNDEW.
Dryopteris spinulosa dilatata (HOFF.) UNDEW.
Polystichum munitum (KAULF.) UNDEW.
Athyrium cyclosorum RUPR.
Struthiopteris spicant (L.) WEISS.
Adiantum pedatum L.
Polypodium falcatum KELLOGG.

PINACEÆ.

Pinus contorta LOUD.
Picea sitchensis (BONG.) TRAUTR. & MEY.
Tsuga mertensiana (BONG.) CARR.
Tsuga heterophylla (RAF.) SARGENT.
Thuja plicata DON.
Chamaecyparis nootkatensis (LAMB.) SPACH.

Taxus brevifolia NUTT.

SCHEUCHZERIAEÆ.

Triglochin maritima L.
Triglochin palustris L.

POACEÆ.

Agrostis exarata TRIN.
Deschampsia cæspitosa (L.) BEAUV.
Dactylis glomerata L.

POACEÆ—continued.

Puccinellia distans (L.) PARL.
Festuca rubra L.
Bromus aleutensis TRIN.
Elymus mollis TRIN.
Elymus sp.

CYPERACEÆ.

Scirpus pauciflorus LIGHTF.
Carex sp.

JUNCACEÆ.

Juncus balticus WILLD.
Juncus bufonius L.
Juncoides parviflorum (EHRH.) COVILLE.

LILIACEÆ.

Fritillaria kamschatcensis (L.) KER.
Unifolium bifolium (L.) GREENE.
Streptopus roseus MICHX.

IRIDACEÆ.

Sisyrinchium littorale GREENE.

ORCHIDACEÆ.

Habenaria hyperborea (L.) R. BR.
Peramium menziesii (LINDL.) MORONG.
Corallorhiza mertensiana BONG.

SALICACEÆ.

Salix scouleriana BARRATT.

BETULACEÆ.

Alnus sinuata (REGEL) RYDB.
Alnus oregona NUTT.

URTICACEÆ.

Urtica lyallii WATS.

POLYGONACEÆ.

Rumex sp.
Polygonum sp.

CHENOPODIACEÆ.

Atriplex gmelini C. A. MEYER.
Salicornia herbacea L.

PORTULACACEÆ.

Montia parvifolia (MOC.) GREENE.
Montia sibirica (L.) HOWELL.

Plants—Continued.

ALSINACEÆ.

Cerastium sp.
Sagina crassicaulis WATS.
Ammodenia peploides (L.) RUPR.
Tissa marina (L.) BRITTON.

RANUNCULACEÆ.

Caltha palustris L.
Coptis asplenifolia SALISB.
Aquilegia formosa FISCHER.
Anemone narcissiflora L.
Ranunculus occidentalis NUTT.
Ranunculus sp.

BRASSICACEÆ.

Cochlearia oblongifolia DC.
Brassica campestris L.
Cardamine angulata HOOK.
Arabis hirsuta SCOP.
Arabis sp.

CRASSULACEÆ.

Sedum roseum (L.) SCOP.
Sedum spathulifolium HOOK.

SAXIFRAGACEÆ.

Saxifraga mertensiana BONG.
Saxifraga nutkana MOC.
Tiarella trifoliata L.
Heuchera cylindrica DOUGL.
Heuchera glabra WILLD.

RIBACEÆ.

Ribes bracteosum DOUGL.
Ribes lacustre (PERS.) POIR.
Ribes laxiflorum PURSH.

ROSACEÆ.

Lutkea pectinata (HOOK.) KUNTZE.
Aruncus aruncus (L.) KARST.
Pyrus rivularis DOUGL.
Crataegus brevispina DOUGL.
Sorbus sambucifolia (C. & S.) ROEM.
Amelanchier alnifolia NUTT.
Rubus pedatus SMITH.
Rubus spectabilis PURSH.
Rubus parviflorus NUTT.
Fragaria chiloensis (L.) DUCHESNE.
Potentilla anserina L.
Potentilla villosa PALL.
Geum calthifolium MENZIES.
Geum sp.
Sanguisorba sp.
Rosa sp.

VICIACEÆ.

Lupinus nootkatensis DONN.
Lupinus nootkatensis unalaskensis WATS.
Trifolium involucratum WILLD.
Lathyrus maritimus (L.) BIGEL.
Vicia gigantea HOOK.

VIOLACEÆ.

Viola glabella NUTT.

ONAGRACEÆ.

Epilobium glandulosum LEHM.
Epilobium hornemanni REICHENB.
Epilobium minutum LINDL.

ARALIACEÆ.

Echinopanax horridum (SMITH) D. & P.

APIACEÆ.

Washingtonia sp.
Conioselinum gmelini COULT. & ROSE
Heracleum lanatum MICHX.

CORNACEÆ.

Cornus canadensis L.
Cornus occidentalis (TORR. & GR.) COVILLE.

PYROLACEÆ.

Moneses uniflora (L.) GRAY.

VACCINIACEÆ.

Vaccinium cespitosum MICHX.
Vaccinium ovalifolium SMITH.
Vaccinium parvifolium SMITH.
Vaccinium uliginosum L.

ERICACEÆ.

Menziesia ferruginea SMITH.
Chamaecistus procumbens (L.) KUNTZE.
Kalmia glauca AIT.
Phyllodoce glanduliflora (HOCK.) COVILLE.
Cassiope mertensiana (BONG.) DON.
Cassiope stelleriana DC.
Gaultheria shallon PURSH.
Arctostaphylos uva-ursi (L.) SPRENG.

PRIMULACEÆ.

Glaux maritima L.
Dodecatheon viviparum GREENE.

Plants—Continued.

NEPETACEÆ.

Prunella vulgaris L.
Stachys sp.

SCROPHULARIACEÆ.

Collinsia parviflora DOUGL.
Mimulus langsdorffii DON.
Veronica americana SCHWEIN.
Castilleja pallida KUNTH.
Castilleja parviflora BONG.
Pedicularis lanata WILLD.
Pedicularis pedicellata BUNGE.

PLANTAGINACEÆ.

Plantago maritima L.
Plantago sp.

RUBIACEÆ.

Galium aparine L.

CAPRIFOLIACEÆ.

Lonicera involucrata (RICH.) BANKS.

VIBURNACEÆ.

Viburnum pauciflorum PYLAIE.
Symphoricarpos racemosus MICHX.
Linnaea borealis L.

CAMPANULACEÆ.

Campanula langsdorffiana FISCH.

CARDUACEÆ.

Grindelia sp.
Erigeron peregrinus (PURSH.) GREENE.
Achillea borealis BONG.
Matricaria discoidea DC.
Senecio resedifolius LESS.
Carduus edulis (NUTT.) GREENE.

FAUNA.

The mammal fauna of the Queen Charlottes, in view of the proximity of the group to the mainland, may be said to be rather meager. There are only 11 species of indigenous land mammals, and 4 of these are bats. The genera represented are *Peromyscus*, *Ursus*, *Lutra*, *Mustela*, *Putorius*, *Sorex*, *Lasionycteris*, and *Myotis*. Characteristic genera of the adjacent mainland, such as *Odocoileus*, *Lutreola*, *Sciurus*, *Eutamias*, and *Microtus*, are entirely wanting. The absence of these genera, which are common on the mainland and well adapted to all the conditions of the islands, indicates that the water barrier between the islands and the mainland is an effective one. The channel is certainly too wide to swim, and small mammals could not easily be carried on driftwood, as the strong tides would be apt to sweep everything of that nature out at either end of Hecate Strait rather than across it.¹ The presence of the marten, an animal which is terrestrial and arboreal, and the absence of the mink, which is semiaquatic, and the deer, which swims considerable distances, might be considered evidence that the islands must have been peopled with animals at a time of complete connection with the mainland. But if at that time the mainland fauna was approximately the same as at present, it is difficult to explain the present absence of the deer and mink. Whatever the case may have been, it is certain that the mammals have been isolated for a

¹ This means of communication is possible, however, as is shown by the fact that the dead bodies of deer have been washed up on the shores of the islands (see p. 25), but the course of the tides is such that they could not have been carried directly across the strait. It is therefore probable that the journey would be too long and perilous for any living animal to survive.

sufficient length of time to become differentiated into well-marked insular forms. All the land mammals that have been studied have proved distinct from the species of the same genera found on the mainland.¹ Moreover, the larger, less mutable forms (*Ursus*, *Mustela*, and *Putorius*), which are also the ones least likely to have been introduced through accident or human agency, are the most strongly characterized, thus affording additional evidence of isolation of rather long standing.

Still more interesting than the general peculiarity of the entire mammal fauna as contrasted with that of the mainland, is the individuality shown among closely adjacent islands when contrasted with one another. A mouse (*Peromyscus prevostensis*) and a shrew (*Sorex l. prevostensis*) are peculiar to Prevost Island. The island is quite small, possibly 50 square miles in area, yet these mammals are found in great abundance, and do not occur on other islands which lie less than a mile away. The channels between these islands are said by Dawson to be accidental, but at least they can not have been formed very recently or this distribution of animals would not be found. *Peromyscus prevostensis*, though from the southernmost island of the group, is most closely related to *P. sitkensis* which has been found only on islands some distance north of the Queen Charlottes, while *P. keeni*, of Graham and Moresby islands is not related to northern forms, but is scarcely distinguishable from the comparatively remote *P. akeleyi* of the Olympic Peninsula, Washington. The small mammals of the northwest coast are still so imperfectly known and they are all so interrelated, that it may be unprofitable to speculate at present on the derivation of various insular forms, and it is possible that the animals are so plastic that their present characters can not safely be taken as indicative of their true relationships.

Birds are comparatively abundant. The species are much the same as those found throughout the whole district from Puget Sound to Glacier Bay, but individuals seem to be more numerous than on the mainland. The land birds frequent the thickets of salmon berry, alder, and willow bushes found bordering sandy beeches or small streams (see Pl. II, fig. 2). In these restricted areas certain species are very common. Many such environments are afforded in Cumshewa and Skidegate inlets, and it was there that most of our collecting was done. The steamer which carried us to the islands dropped anchor in Cumshewa Inlet, about 50 yards from the shore at 5 o'clock in the morning of June 13, and through the little port of my stateroom sounded such an avian chorus as I have heard nowhere else on the northwest coast. The greatest volume of song came from song spar-

¹ The land otter, *Lutra*, is the only one known to occur on the islands of which no specimens have been critically examined.

rows and fox sparrows, but the rich tones of the russet-backed thrushes contributed much to strength and quality; winter wrens bubbled and spluttered on all sides, the clear notes of a robin were heard now and then, and from farther back in the forest came the weird call of the varied thrush, while all the time several huge ravens carried on a lively conversation with one another. The deep forest is for the most part dark and quiet, and save for an occasional creeper or winter wren contains no birds. Water birds are reported to breed in large colonies on islets near the west coast of Moresby Island. We were unable to visit these, but observed small rookeries at the mouth of Cumshewa Inlet and in Houston Stewart Channel.

Very few of the land birds are definitely separable from those of the Sitkan district, but the tendency to dark colors and heavy markings is extreme. Two forms are peculiar to the islands, a jay (*Cyanocitta stelleri carlottæ*) and a woodpecker (*Dryobates picoides*), both of which belong to groups not known to be as variable as others, such as *Junco*, *Melospiza*, and *Passerella*, whose Queen Charlotte representatives are not strongly characterized. Ninety-six species are known to occur on the islands, 62 of which are found in the breeding season. For notes on the occurrence of many of the species, I am greatly indebted to Rev. J. H. Keen, whose observations at Massett covered a period of eight years.

Besides the mammals and birds but one land vertebrate has been found on the islands, a toad (*Bufo halophilus columbiensis*), which is common on the adjacent mainland. We noted no strictly fresh-water fishes, but trout are reported to inhabit some of the streams. A collection of several hundred littoral species of fish was made, chiefly by Mr. Edmund Heller, who has determined the species and found none of them peculiar. Conditions about the islands are exceedingly favorable for marine invertebrate life and it flourishes in profusion, but no attempt at collecting such forms was made.

The vertebrate fauna of the islands, as a whole, is very similar to that of the adjacent mainland, but is nevertheless peculiar in many respects. The vertebrates known to occur on or about the islands are as follows:

MAMMALS.

- | | |
|--|--|
| 1. <i>Globicephala scammoni</i> . | 11. <i>Mustela nesophila</i> . |
| 2. <i>Balenoptera velifera</i> . | 12. <i>Eumetopias stelleri</i> . |
| 3. <i>Lagenorhynchus obliquidens</i> . | 13. <i>Otoes alascanus</i> . |
| 4. <i>Phocaena phocaena</i> . | 14. <i>Phoca largha</i> . |
| 5. <i>Odocoileus columbianus</i> sitkensis | 15. <i>Sorex longicauda prevostensis</i> . |
| (introduced). | 16. <i>Sorex longicauda elassodon</i> . |
| 6. <i>Peromyscus keeni</i> . | 17. <i>Lasionycteris noctivagans</i> . |
| 7. <i>Peromyscus prevostensis</i> . | 18. <i>Myotis yumanensis saturatus</i> . |
| 8. <i>Ursus carlottæ</i> . | 19. <i>Myotis subulatus keeni</i> . |
| 9. <i>Lutra canadensis</i> subsp. | 20. <i>Myotis californicus caurinus</i> . |
| 10. <i>Putorius haidarum</i> . | |

BIRDS.

1. *Gavia imber*.¹
2. *Gavia pacifica*.¹
3. *Gavia lumme*.¹
4. *Lunda cirrhata*.¹
5. *Fratercula corniculata*.
6. *Synthliboramphus antiquus*.
7. *Brachyramphus marmoratus*.¹
8. *Cepphus columba*.¹
9. *Uria troile californica*.¹
10. *Rissa tridactyla pollicaris*.
11. *Larus glaucescens*.¹
12. *Larus brachyrhynchus*.
13. *Larus philadelphia*.
14. *Puffinus griseus*.
15. *Puffinus tenuirostris*.
16. *Oceanodroma furcata*.
17. *Phalacrocorax pelagicus*.¹
18. *Merganser americanus*.¹
19. *Merganser serrator*.¹
20. *Anas boschas*.¹
21. *Mareca americana*.
22. *Nettion carolinensis*.
23. *Dafila acuta*.
24. *Aythya* sp.¹
25. *Clangula clangula americana*.
26. *Charitonetta albeola*.
27. *Harelda hyemalis*.
28. *Histrionicus histrionicus*.
29. *Oidemia deglandi*.¹
30. *Oidemia perspicillata*.¹
31. *Anser albifrons gambeli*.
32. *Branta canadensis occidentalis*.¹
33. *Olor* sp.
34. *Ardea herodias fannini*.
35. *Porzana carolina*.
36. *Gallinago delicata*.
37. *Tringa acuminata*.
38. *Ereunetes occidentalis*.
39. *Calidris arenaria*.
40. *Totanus melanoleucus*.
41. *Actitis macularia*.
42. *Squatarola squatarola*.
43. *Charadrius dominicus*.
44. *Arenaria melanocephala*.
45. *Hæmatopus bachmani*.¹
46. *Dendragapus obscurus fuliginosus*.¹
47. *Zenaidura macroura*.
48. *Accipiter velox*.¹
49. *Accipiter atricapillus striatulus*.
50. *Buteo borealis calurus*.¹
51. *Haliaeetus leucocephalus alascanus*.¹
52. *Falco peregrinus pealei*.¹
53. *Falco columbarius suckleyi*.¹
54. *Pandion haliaëtus carolinensis*.¹
55. *Megascops asio kennicotti*.¹
56. *Nyctala acadica scotæa*.¹
57. *Nyctea nyctea*.
58. *Ceryle alcyon*.¹
59. *Dryobates picoides*.¹
60. *Sphyrapicus ruber flaviventris*.¹
61. *Colaptes cafer saturator*.¹
62. *Selasphorus rufus*.¹
63. *Empidonax difficilis*.¹
64. *Cyanocitta stelleri carlottæ*.¹
65. *Corvus corax principalis*.¹
66. *Corvus caurinus*.¹
67. *Pinicola enucleator flammula*.¹
68. *Loxia curvirostra minor*.¹
69. *Loxia leucoptera*.¹
70. *Spinus pinus*.¹
71. *Passerina nivalis*.
72. *Ammodramus sandwichensis alauidus*.
73. *Calcarius lapponicus alascanus*.
74. *Zonotrichia coronata*.
75. *Junco hyemalis oregonus*.¹
76. *Melospiza melodia rufina*.¹
77. *Passerella iliaca townsendi*.¹
78. *Hirundo erythrogastra*.¹
79. *Tachycineta bicolor*.¹
80. *Tachycineta thalassina*.¹
81. *Helminthophila celata lutescens*.¹
82. *Dendroica æstiva rubiginosa*.¹
83. *Dendroica townsendi*.¹
84. *Wilsonia pusilla pileolata*.¹
85. *Anthus pensilvanicus*.¹
86. *Cinclus mexicanus*.¹
87. *Anorthura hiemalis pacifica*.¹
88. *Certhia familiaris occidentalis*.¹
89. *Sitta canadensis*.¹
90. *Parus rufescens*.¹
91. *Regulus satrapa olivaceus*.¹
92. *Regulus calendula grinnelli*.¹
93. *Hylocichla ustulata*.¹
94. *Hylocichla aonalaschke verecunda*.¹
95. *Merula migratoria propinqua*.¹
96. *Hesperocichla nævia*.¹

BATRACHIAN.

Bufo halophilus columbiensis.

¹ Known, or supposed, to breed.

FISHES.¹

<i>Squalus sucklii.</i>	<i>Oligocottus maculosus.</i>
<i>Hydrolagus collicii.</i>	<i>Blenicottus globiceps.</i>
<i>Clupea pallasii.</i>	<i>Ascelichthys rhodorus.</i>
<i>Oncorhynchus sp.</i>	<i>Caularchus maendricus.</i>
<i>Salmo sp.</i>	<i>Apodichthys flavidus.</i>
<i>Gasterosteus cataphractus.</i>	<i>Pholis ornatus.</i>
<i>Aulorhynchus flavidus.</i>	<i>Anoplarchus atropurpureus.</i>
<i>Cymatogaster aggregatus.</i>	<i>Xiphistes chirus.</i>
<i>Sebastodes melanops.</i>	<i>Xiphidion umcosum.</i>
<i>Sebastodes caurinus.</i>	<i>Xiphidion rupestre.</i>
<i>Hexagrammus stelleri.</i>	<i>Theragra fucensis.</i>
<i>Ophiodon elongatus.</i>	<i>Gadus macrocephalus.</i>
<i>Arctedius lateralis.</i>	<i>Hippoglossus hippoglossus.</i>
<i>Hemilepidotus hemilepidotus.</i>	<i>Psettichthys melanostictus.</i>
<i>Euophrys bison.</i>	<i>Limander asper.</i>
<i>Leptocottus maculosus.</i>	

LIFE ZONES.

The zones of the Queen Charlottes are the Canadian and the Hudsonian. The greater part of the group, at least all that which lies below an altitude of 2,500 feet, is Canadian, and the remainder above that elevation is Hudsonian. This zonal definition is determined almost entirely by the plant life. The insular occurrence of various species of mammals, and to some extent of birds, may be due to accident and unnatural agency; therefore the absence of certain forms obviously can not be considered significant in correlating island and continental zones. Moderate insular isolation restricts vegetation much less than animal life; so that in determining the faunal position of the Queen Charlottes the fact that practically all the trees and shrubs are those usually found in the Canadian and Hudsonian zones is of much more importance than that no mammals occur other than those of the Canadian zone.

The latitude of the southern part of the group is about the same as that of the mainland where the Transition zone merges into the Canadian, and since the average temperature on the islands may be assumed to be slightly warmer than on the mainland, some Transition intrusions might be expected. These are comparatively few, however, and may safely be disregarded in a general definition of the zones of the group. The characteristic Transition tree, *Pseudotsuga mucronata*, which reaches its northern limit on the mainland in about this latitude, has not been found on the Queen Charlottes. None of the coniferous trees, with the possible exception of *Taxus brevifolia*, can be considered unequivocal Transition species. *Picea sitchensis*, *Tsuga heterophylla*, *Thuja plicata*, and *Pinus contorta* all range throughout the Sitkan district, which is Canadian, and, roughly speaking, extends

¹ Species determined by Mr. Edmund Heller.

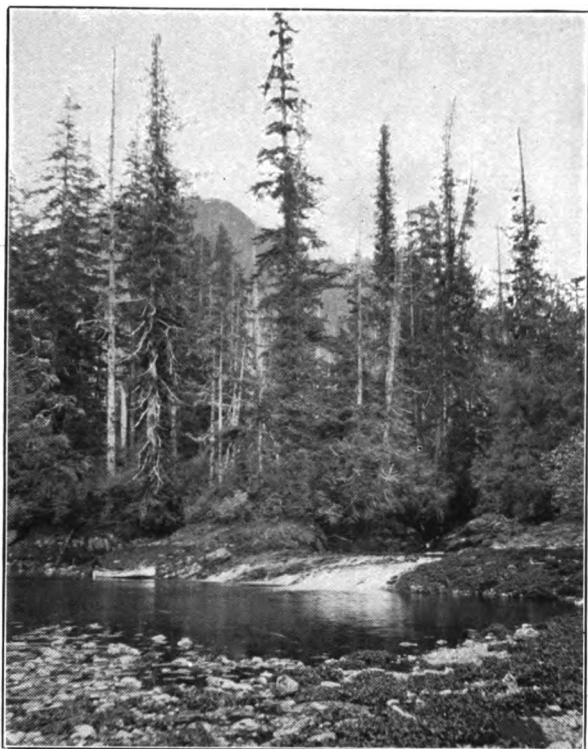


FIG. 1.—MOUTH OF STREAM, CUMSHEWA INLET.



FIG. 2.—SHORE OF BARE ISLAND, SKIDEGATE INLET.

from River Inlet, British Columbia, to Cross Sound, Alaska. Among the small shrubs of the Queen Charlottes that also range through this Canadian district may be mentioned *Alnus sinuata*, *Ribes lariflorum*, *Ribes bracteosum*, *Vaccinium ovalifolium*, *Menziesia ferruginea*, *Viburnum pauciflorum*, *Arctostaphylos uva-ursi*, and *Echinopanax horridum*.

The Hudsonian zone occupies those parts of the islands which are above an elevation of about 2,500 feet.¹ The mountains which exceed this height are distributed in four principal groups, namely, those of the southwestern part of Graham Island, those of the head of Cumshewa Inlet, Moresby Island, those of the central part of Louise Island, and those lying along Darwin Sound, and known as the San Cristoval Range² (see fig. 1). The only part of the Hudsonian zone

actually traversed by us is that on the principal peak at the head of West Arm of Cumshewa Inlet. There the timber on the lower slopes of the mountain was found to be very heavy and of much the same character as that of the shore, the principal difference being the absence of *Taxus*, which seems to be confined to the immediate border of the inlets. At an altitude of about 2,000 feet a more decided difference in the flora began to be noticeable. This change progresses rapidly. The giant cedar (*Thuja*) disappears entirely, and the spruce (*Picea*) and western hemlock (*Tsuga heterophylla*) are much reduced in numbers. The alpine hemlock (*Tsuga mertensiana*) and the yellow cedar (*Chamaecyparis nootkensis*) take a place in the forest and soon become well established as the predominating trees, the hemlock being slightly in the ascendancy. Many smaller Hudsonian plants appear simultaneously with these trees and continue with them nearly or quite to the summit. Among these may be mentioned *Cassiope stelleriana*, *Cassiope mertensiana*, *Phyllodoce glanduliflora*, *Kalmia glauca*, *Vaccinium caespitosum*, *Vaccinium uliginosum*, *Chamaecistus procumbens*, *Luetkea pectinata*, *Caltha palustris*, *Pedicularis lanata*, and *Pedicularis pedicellata*. On the higher ridges a few individuals of *Tsuga heterophylla*, *Picea sitchensis*, and *Pinus contorta* still persist, but in an exceedingly depauperate condition. Between the ridges are characteristic glades and heather meadows, and in occasional suitable basins clear pools of seepage water. Thus the



FIG. 1.—Outline map of the Queen Charlotte Islands, showing extent of the Hudsonian zone.

¹The elevations given are estimates only, as I was not equipped with a barometer.

²Very few of the mountains have been named, therefore it is necessary to make awkward descriptive reference to them.

general aspect of this belt between 2,500 feet altitude and the summit is that of a pure Hudsonian-Alpine zone, such as is found on the mountains of the mainland in the same latitude. Although this mountain and others near it carry large banks of snow the year round, a definite timberline does not exist on them, for a few trees straggle practically to the summits, and smaller plants flourish on the favored sides of the very highest pinnacles.

BIBLIOGRAPHY.

The following titles are merely those of such books as have been consulted in the preparation of this report. By far the most important is the general report by the late Dr. George M. Dawson. Other published references to the natural history of the islands are largely such as have resulted from the work of Rev. J. H. Keen.

1789. DIXON, CAPTAIN GEORGE. A Voyage Round the World, but more particularly to the North-West Coast of America performed in the *King George* and *Queen Charlotte*, Captains Portlock and Dixon. pp. 199-234. London, 1789.
General account of a visit to the islands with notes on fur trading with the natives.

1868. BROWN, ROBERT. Synopsis of the Birds of Vancouver Island. <Ibis, IV, 424, 1868.

Mentions occurrence of *Hæmatopus niger* on Queen Charlotte Islands.

1869. BROWN, ROBERT. Physical Geography of the Queen Charlotte Islands. <Rept. Brit. Ass. Adv. Sci. XXXVIII (for 1868), Notices and Abstr., pp. 133-134, 1869.
Brief notes on geography, geology, and ethnology.

1871. BROWN, ROBERT. Notes on Arctic Zoology. <Ann. and Mag. Nat. Hist., ser. 4, VII, 64-66, Jan., 1871.

Reference to a skull of *Phocæna communis* (= *Phocæna phocæna*) brought from the islands and sent to the British Museum.

1872. POOLE, FRANCIS. Queen Charlotte Islands. A Narrative of Discovery and Adventure in the North Pacific. Edited by J. W. Lyndon. 8vo., pp. 1-347. London, Hurst and Brackett.

An account of two years' sojourn in the islands. The natural history notes which are summarized on pp. 305-309 are of questionable value. The following is the list of birds given as frequenting the neighborhood of Burnaby Island exactly as printed on p. 308:

Night-hawk—*falco nocturnus*.
Sparrow-hawk—*falco sparverius*.
Goshawk—*astur atricapillus*.
White-headed eagle—*haliaetus leucocephalus*.
Belted kingfisher—*alcedo accinctus*.
Western bluebird—*cyanæus occidentalis*.
North Western fish-crow—*corvus caurinus*.
Wilson's snipe—*gallinago wilsonii*.
Canadian goose—*bernacæ canadensis*.
White-checked goose—*bernacæ leucoparsia*.
Mallard (stock duck)—*anas boschas*.

Canvas-back duck—*aythya valisineria*.
Golden-eye (whistle-wing duck)—*bucephala americana*.
Buffle-head duck—*bucephala albeola*.
Harlequin duck—*histrionicus torquatus*.
Velvet duck—*malanetta velutina*.
Glaucous-winged duck—*larus glaucescens*.
Suckley's gull—*larus suckleyii*.
Great Northern diver—*colymbus torquatus*.
Red-necked grebe—*podicetus grisgeria*.

1880. DAWSON, GEO. M. Report on the Queen Charlotte Islands. Geological Survey of Canada. Report of Progress for 1878-79, III, 1-239, Montreal, 1880.
- Consists of a general report subdivided as follows: (1) Position, Discovery, and Early History of the Islands; (2) General Description; (3) Geological Observations; and seven appendixes, as follows:
- A. On the Haida Indians of the Queen Charlotte Islands, by Geo. M. Dawson.
 - B. Vocabulary of the Haida Indians, by Geo. M. Dawson.
 - C. On Some Marine Invertebrata from the Queen Charlotte Islands, by J. F. Whiteaves.
 - D. Notes on Crustacea from the Queen Charlotte and Vancouver Islands, by S. I. Smith.
 - E. List of Plants from the Queen Charlotte Islands, by John Macoun.
 - F. Meteorological Observations, by Geo. M. Dawson.
 - G. Notes on Latitudes and Longitudes, by Geo. M. Dawson.
- 1883-1892. MACOUN, JOHN. Catalogue of Canadian Plants, pts. i-iv, pp. 1-398; pt. vi, pp. 1-277, Montreal, 1883-1892.
- Contains references to various plants collected by Dawson on the Queen Charlotte Islands.
1887. CHAMBERLAIN, MONTAGUE. Catalogue of Canadian Birds, St John, New Brunswick, 1887.
- Mentions occurrence of *Fratercula corniculata*, *Uria troile californica*, *Larus glaucescens*, and *Larus brachyrhynchus*.
1890. DAWSON, GEO. M. Later Physiographical Geology of the Rocky Mountain Region in Canada. <Trans. Royal Soc. Canada, VIII, Sec. IV, 51-52, 1890.
- Contains reference to supposed occurrence of caribou on Queen Charlotte Islands.
1891. MACKENZIE, ALEX. Descriptive notes on certain implements, weapons, etc., from Graham Island, Queen Charlotte Islands, British Columbia. <Trans. Royal Soc. Canada, IX, Sec. II, 45-59, 1891.
- Refers to tomahawk made of native (?) reindeer antler (p. 50).
1894. RHODES, S. N. *Sitomys keeni* sp. nov. <Proc. Acad. Nat. Sci. Phila. (1894), 258-259, Oct. 23, 1894.
- Type from Massett, Graham Island.
1895. KEEN, J. H. List of *Coleoptera* collected at Massett, Queen Charlotte Islands, British Columbia. <Canadian Entomologist, XXVII, 165-172, July, 1895; cont. pp. 217-220, Aug., 1895.
- A list of 222 species, with brief notes by the collector.
1895. MERRIAM, C. HART. Bats of Queen Charlotte Islands, British Columbia. <American Naturalist, XXIX, 860-861, Sept. 1, 1895.
- Vespertilio subulatus keenii* subsp. nov. Type from Massett, Graham Island.
1897. KEEN, J. H. Three interesting Staphylinidæ from Queen Charlotte Islands. <Canadian Entomologist, XXIX, 285-287, Dec., 1897.
1898. PREBLE, E. A. Description of a New Weasel from the Queen Charlotte Islands, British Columbia. <Proc. Biol. Soc., Wash., XII, 169-170, Aug. 10, 1898.
- Putorius haidarum* sp. nov. Type from Massett, Graham Island.
1898. DORSEY, GEORGE A. A Cruise Among Haida and Tlingit Villages about Dixon's Entrance. <Popular Science Monthly, LIII, 160-174, 1898.
- An account of an ethnological expedition which visited Massett and other native villages. No important notes on natural history.

1898. FANNIN, JOHN. A preliminary catalogue of the collections of natural history and ethnology in the Provincial Museum, Victoria, British Columbia, 1898.
Mentions several mammals from the Queen Charlotte Islands and the following birds: *Fratercula corniculata*, *Rissa tridactyla pollicaris*, *Puffinus griseus*, and *Tringa acuminata*.
1900. SETON-THOMPSON, ERNEST. *Rangifer dawsoni*, preliminary description of a new Caribou from Queen Charlotte Islands. <Ottawa Naturalist, XIII, 257-261, Pls. IV, V, Feb., 1900.
1900. MACOUN, JOHN. Catalogue of Canadian Birds, Part I, Geological Survey of Canada, Ottawa, 1900.
Mentions occurrence of *Puffinus griseus*, *Puffinus tenuirostris*, *Tringa acuminata*, and *Bonasa umbellus sabinet*.
1901. OSGOOD, WILFRED H. New subspecies of North American birds. <Auk. XVIII, 179-185, April, 1901.
Contains description of *Hylocichla aonalaschkae verecunda*. Type from Cumshewa Inlet. Moresby Island.
1901. CHAPMAN, FRANK M. A New Race of the Great Blue Heron, with Remarks on the Status and Range of *Ardea wardi*. <Bull. Am. Mus. Nat. Hist., New York, XIV, 87-90, April 15, 1901.
Ardea herodias fannini subsp. nov. Type from Skidegate, Graham Island.

MAMMALS OF THE QUEEN CHARLOTTE ISLANDS.

Globicephala scammoni Cope. Blackfish.

Common in Hecate Strait. While our little schooner was *en route* to and from Prevost Island small schools played about it every day, and often with a familiarity that was alarming.

Balænoptera velifera Cope. Finback Whale.

A party of about half a dozen whales was seen in Hecate Strait July 2.

? **Lagenorhynchus obliquidens** Gill. Striped Porpoise.

A porpoise supposed to be this species kept within a few feet alongside the schooner for some time while we were sailing in Hecate Strait July 7.

Phocæna phocæna Linn. Common Porpoise.

A school of porpoises numbering at least 100 individuals was seen in Hecate Strait July 7; others were frequently seen in the strait.

A skull, evidently of this species, was sent from the islands by Dr. Robert Brown in 1868 to the British Museum.¹

[Odocoileus columbianus sitkensis Merriam. Sitka Deer.

Deer have been introduced on the islands, but have not yet thoroughly established themselves there. I was told by Rev. Mr. Collinson, who was formerly in charge of the missionary work at Massett, that he was instrumental in the introduction of a few deer on Graham Island some years ago. Nine individuals from the vicinity of Port Simpson were liberated at Massett; and within a year signs of them were seen near Skidegate. Mr. Tennant, of Skidegate, states that a deer was killed by Indians about two years ago on Moresby Island, near Skidegate, but that since that time no deer or tracks have been reported. According to Rev. Mr. Collinson the dead bodies of deer from the mainland are occasionally found washed up on the beaches of the islands.]

¹ Ann. and Mag. Nat. Hist., ser. 4, VII, 64, 1871. This specimen is probably the one referred to by Flower as having come from Vancouver Island. (List Cetacea Brit. Mus., p. 16, 1885.)

[*Rangifer dawsoni*¹ (= *Rangifer arcticus*).

The description of a caribou from the Queen Charlotte Islands was, to say the least, somewhat unexpected, so in visiting the islands I was particularly interested in obtaining information in regard to it. I could find no evidence, however, that native caribou ever existed on any of the islands. Rev. Mr. Keen, who lived at Massett for eight years, and who was specially interested in matters pertaining to natural history, says that from his own experience and that of the oldest Indian hunters, whom he questioned closely, he is decidedly of the opinion that no caribou are to be found in any part of the islands. Rev. Mr. Collinson, who was one of the earliest missionaries at Massett, has the same belief as Mr. Keen, though he did not express such definite conclusions. Besides the missionaries I also interviewed a Mr. Stevens, who has kept the general store at Massett for the past nine years, and obtained from him the same opinion. All these persons are familiar with the story of 'Mackenzie's caribou,' which is doubtless the cause of the mistaken idea that a peculiar species is native to Graham Island. According to this story, which was told me independently and without essential variation by Messrs. Keen, Collinson, and Stevens, some fifteen or twenty years ago Mr. Alexander Mackenzie, a trader for the Hudson Bay Company at Massett, conceived the idea that in such a favorable place as Graham Island there must be deer and caribou, though the Indians had never killed them or even seen their tracks. Accordingly he offered a reward to anyone who should kill one or bring him evidence of having done so. The offer remained open for a long time, but finally a claimant appeared with fragments of a caribou, including the head. This imperfect specimen passed through several hands and finally found its way to the Provincial Museum in Victoria, where it was unearthed to receive the name *Rangifer dawsoni*. If the reward was incident to such a statement the Indian who brought this specimen to Mackenzie no doubt solemnly averred that he killed it on Graham Island. An Indian's testimony in a case of this kind, however, would not hang very heavy in the balance, even against a small amount of circumstantial evidence. Mr. Mackenzie is not now living, but the testimony of Mr. W. Charles, who received the caribou head from him, indicates that for its absolute origin we have the word of the Indians only. In response to a letter to Mr. Charles I received an answer from Mr. J. R. Anderson, deputy minister of agriculture at Victoria, from which the following is extracted:

Some time ago Mr. W. Charles, who is an invalid, handed me your letter of the 10th January last regarding the occurrence of caribou on Queen Charlotte Islands. Mr. Charles asked me to communicate with you and say that the head referred to, and which had deformed antlers, undoubtedly came from Queen Charlotte Islands, hav-

¹Seton-Thompson, *Ottawa Naturalist*, XIII, 257-261, Feb., 1900.

ing been sent to him by the Hudson Bay Company agent there, and was equally that of a caribou. The animal, Mr. Charles has no reason to doubt, was actually killed by the Indians, and they being unacquainted with it, brought the skull to Mackenzie, and reported more of the same kind in the interior of the island.

From this it seems that all the information in regard to the Mackenzie specimen came from the Indians, and that no white man has given any direct first-hand testimony as to its absolute origin.

At the instance of Mr. Anderson a brief request for information was inserted in the 'Daily Colonist,' of Victoria, B. C., and several replies were received. One of these, from Mr. S. M. Harrison, of Massett, which is of considerable interest, was kindly forwarded to me. It is addressed to Mr. Anderson under date of April 30, 1901, and is as follows:

SIR: I noticed a paragraph in the Colonist under the heading of "Who knows" re the existence of caribou on Queen Charlotte Islands. I have lived here twenty years, and know the account given is quite correct. I have made diligent inquiries amongst the Indians, and have gained the following information:

(1) Three years ago an Indian named Shakwau saw a female caribou feeding near a lake up Virago Sound, but failed to kill it, although he fired twice. Yethgwonas, another Indian, was with him at the time.

(2) This March a man named Stlinga with his two sons saw the tracks of a big herd near the headwaters of Malon River, near Virago Sound.

(3) Men who were with the man who killed the two referred to in the Colonist are ready to show me the place where he killed them. This is near Lthum, up Virago Sound.

(4) The Haidas refused to eat the flesh of the caribou and left their carcasses. Mr. Mackenzie then paid them to go and bring the meat in and kept it for his own use.

(5) As the Indians are not interested in the killing of caribou, they refusing to eat the meat and there being no market for the antlers, etc., they consequently do not hunt them. They say they are afraid to go up the mountains and into much danger for no recompense, there being, according to their traditions, one-eyed monsters, hobgoblins, spirits, etc., to be met with on the mountains which they frequent. * * *

This, though much more definite than any other report received, contains little which did not emanate from the Indians, and it is therefore difficult to be certain that it contains any element of reliability. Surely men who believe in "one-eyed monsters, hobgoblins," etc., could easily indulge themselves with an imaginary caribou. However, Mr. Harrison's statement that meat was brought to Mackenzie and used by him is much more worthy of consideration and might lead one to entertain a belief in the *possibility* that caribou were killed on Graham Island, but the *probability* that such was the case is still doubtful.

If the type specimen of *Rangifer dawsoni* originally came from the mainland, as seems probable, instead of from Graham Island, it may either have been deliberately bartered for with the intention of obtaining a reward, or it may have been innocently brought to the islands to be used in the native arts. More or less communication has always existed

ensis appears to be entirely confined to Prevost Island, as it was taken nowhere else in the Queen Charlotte group. Exactly opposite Prevost Island, on the south end of Moresby Island, *P. keeni* only was caught, as was the case elsewhere on Moresby Island. The distance between the two islands at this point is less than a mile, but it is probable that the strong tides which sweep through the channel would carry logs or any floating débris out to sea rather than from shore to shore, and thus prevent small mammals from being transferred. *P. prevostensis* is so different from *P. keeni* that even if the islands were more closely connected it would be improbable that either species was derived from the other. Moreover, it is also questionable whether either is the immediate descendant of *P. macrorhinus*, the form of the adjacent mainland, as both are more similar to forms found at a greater distance. Notwithstanding its geographic position, *P. prevostensis* is related neither to the mainland species of the same latitude nor to any of those farther south, but to *P. sitkensis*, which is found much farther north. In fact, considering its distribution, its resemblance to *sitkensis* is remarkable; it is characterized only by a combination of slight peculiarities. It seems best, however, to treat it as a full species until the rather difficult subject of the distribution of the section of the genus to which it belongs is more clearly understood.

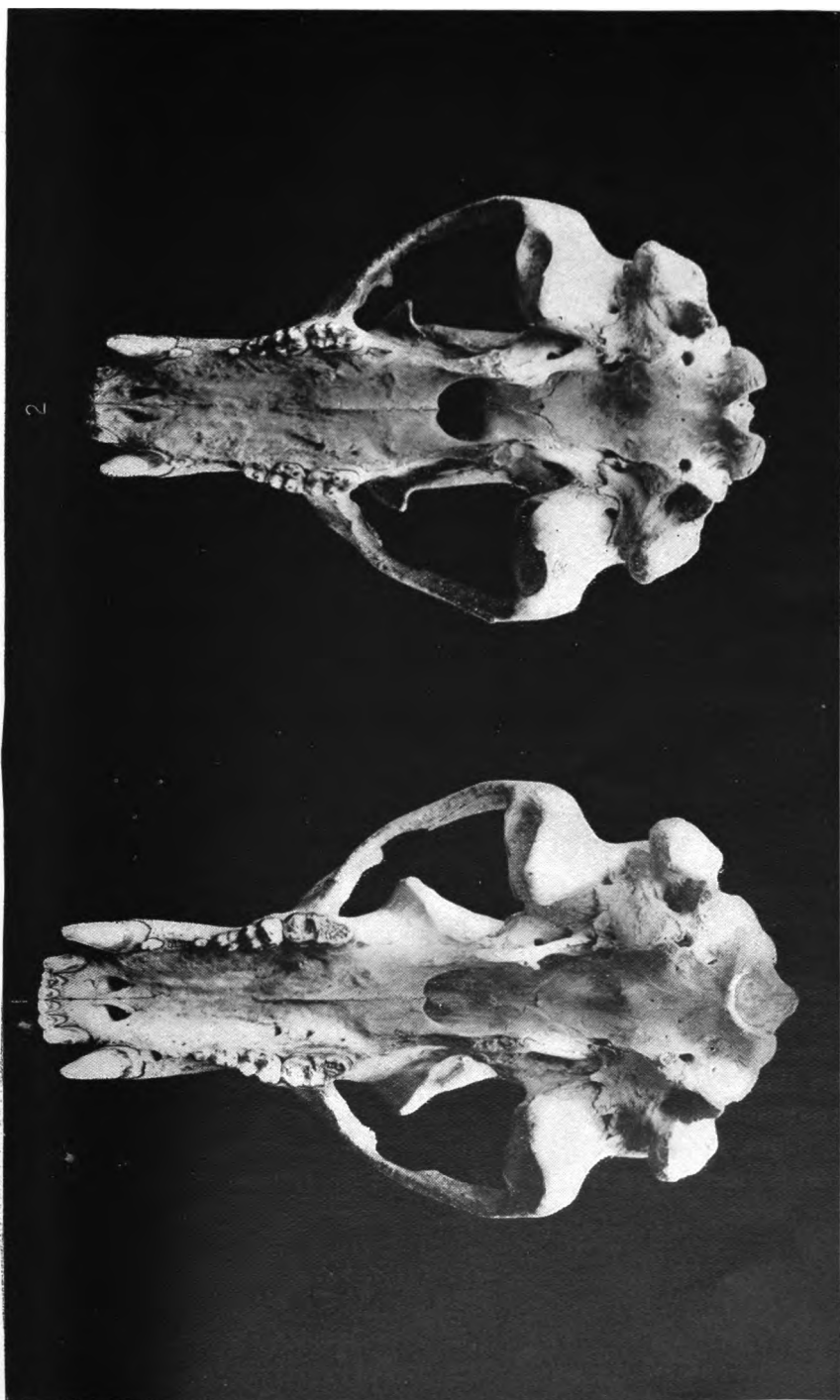
***Ursus (Euarctos) carlottæ* sp. nov.** Queen Charlotte Black Bear.

Type from Massett, Graham Island; Queen Charlotte Islands, British Columbia.

Skull only, No. 87620, U. S. National Museum, Biological Survey collection, Nov., 1896, J. H. Keen.

Characters.—Size slightly greater than *Ursus americanus*; skull more elongate; rostrum relatively more slender; cranium less arched; teeth larger and heavier, particularly last molars; last upper molar with posterior 'heel' quite elongate. (See Plate IV.)

Measurements.—The following table gives measurements of 6 full-grown old skulls of *U. americanus* from western North America and one adult (the type) and 6 immature skulls of *carlottæ*. The measurements of the type of *carlottæ* are the only ones fairly comparable with those given of *americanus*, but those of the young skulls are introduced to show the relatively large size of the last upper molar. No. 87618, for example, is the skull of a mere cub, yet its last upper molar is much larger than any of those of the full-grown specimens of *americanus*.



SKULLS OF *URSUS* (ABOUT ONE-THIRD NATURAL SIZE).

1. *Ursus carlottae*.

2. *Ursus americanus*.

URSUS CARLOTTÆ.

Num-ber.	Locality.	Sex.	Basilar length of Hensel.	Palatal length.	Postpalatal length.	Zygomatic breadth.	Width across posterior processes.	Length of nasals.	Posterior edge of alveolus of canine to posterior edge of alveolus of last molar.	Crown of last upper molar.
87620	Massett, British Columbia.....	? ♂ ad.	282	155	127	193	116	82	88	30
78065	.....do.....	? im.	260	146	114	162	97	70	84	31
87619	.....do.....	? im.	240	139	101	145	88	76	80	31.5
75052	.....do.....	? im.	230	130	100	137	81	66	78	30
87617	.....do.....	? im.	233	134	99	137	86	70	78	27
87621	.....do.....	? im.	223	127	96	132	78	59	76	27
87618	.....do.....	? im.	200	115	85	119	73	55	73	29

URSUS AMERICANUS.

72332	Shuswap, British Columbia...	♀ old	260	144	116	168	94	78	81	26
75304	Jasper House, Alberta	♀ ad.	260	140	120	186	101	65	76	25
31277	Salmon River Mountains, Idaho.	? ad.	255	139	114	181	94	67	77	25.5
75053	Cook Inlet, Alaska	? ad.	254	138	116	172	109	73	81	27
48214	Stuart Lake, British Columbia.	? ad.	260	142	118	187	113	78	77	26.5
53577	.....do.....	? ♂ ad.	266	143	123	186	101	75	77	24

Remarks.—Seven perfect skulls of the Queen Charlotte black bear are in the Biological Survey collection, and although most of them are those of immature animals there is no difficulty in distinguishing any of them from mainland specimens. In comparisons specimens from western British Columbia and Alaska have been used to represent *americanus*, which, as far as known at present, ranges from the Atlantic to the Pacific. No specimens are available from the west side of the coast mountains on the mainland opposite the Queen Charlottes, but a few from the region immediately north (Cook Inlet and White Pass) and south (Olympic Peninsula) have been examined, and none of them show any approach to *carlottæ*. The skull of *Ursus luteolus* is equal in size to that of *carlottæ*, but the teeth, though as long as in *carlottæ*, are much wider and heavier. In *carlottæ* the brain case is fuller, the arch of the cranium much greater, and the interorbital region wider. At the suggestion of G. S. Miller, jr., the skull of *U. carlottæ* was compared with that of *Ursus procerus*, the fossil species from Ohio, and more or less superficial resemblance between them was found, though, of course, detailed diagnostic characters are numerous. Both agree in general form of skull, particularly in the elongate rostrum in contrast with that of *U. americanus*. The dentition of *procerus*, however, is much heavier and otherwise different, while other characters are abundant, indicating that the resemblance

to *carlottæ* is merely coincidental and not indicative of close relationship. No skins of *carlottæ* have been examined, but they are said to be glossy black at all times, the cinnamon form being absolutely unknown on the islands. The skulls on which the foregoing description is based were secured from the natives at Massett, in 1895 and 1896, by Rev. J. H. Keen, to whom we are indebted for so many other specimens from the Queen Charlottes. I saw signs of bear only on the mountain at the head of West Arm of Cumshewa Inlet, and there the indications were not fresh enough to raise any hopes of securing a specimen. The Haidas hunt bears to some extent, and also secure them in dead-fall traps. I noticed several of these traps near the head of Cumshewa Inlet, but they had not been used for some time. Mr. Tennant, of Skidegate, secures from the Indians 10 to 30 skins annually.

Lutra canadensis subsp. ? Land Otter.

Otters are rather rare on the Queen Charlottes, though perhaps no more so than on the mainland. Mr. Tennant, of Skidegate, says that his annual receipts from the Indians have seldom included more than a dozen otter skins. This is the only mammal known to occur on the islands of which I have not examined specimens.

Putorius haidarum Preble.¹ Haida Weasel.

Three specimens of this weasel were caught about Cumshewa Inlet and one at Skidegate. Traps baited with fish and set along the shore in the rank grass or in the rocks were the most successful. The type of this species is in winter pelage with slight traces of the summer coat, indicating, as Mr. Preble noted, a probable color difference from *Putorius kadiacensis*. This surmise is amply borne out by our specimens in full summer pelage. They are much darker than *kadiacensis*, displaying very nearly the rich chocolate of *P. streator*, and having much less of the lemon-yellowish wash on the underparts than *kadiacensis*. The color of the upperparts does not encroach on that of the belly, and the black on the tail is extensive, occupying nearly half its length; in these respects it is more like *kadiacensis* than *streator*. The white of the underparts extends on the under side of the tail for about one-third of its length. The fore feet are entirely white; the toes and one-third of the upper side of the hind feet are white. Its skull is quite distinct from that of any other of the *cicognani* group. In general terms, it is flat, short, and stocky. The most conspicuous point of difference from *kadiacensis*, *cicognani*, or *streator* is the very broad rostrum and interorbital region. Young specimens entirely free from parasites show this to good advantage, and adult skulls which are infested are so much wider than those of

¹ Proc. Biol. Soc. Wash., XII, 169-170, Aug. 10, 1898.

kadiacensis in a similar condition that they are easily distinguishable. The flesh measurements of a fully adult male are as follows: Total length, 283; tail vertebrae 70; hind foot 39. Adult female: 252; 63; 31. Skull of adult male: Basal length 39; mastoid breadth 19.2; width across postorbital processes 14.5; palatal length 17.5; length of audital bullae 13. Skull of adult female: 35.5; 17.5; 12; 16.5; 11.6.

***Mustela nesophila* sp. nov.** Queen Charlotte Marten.

Type from Massett, Graham Island, Queen Charlotte Islands, British Columbia. Skull only. Male (?), No. 78066, U. S. National Museum, Biological Survey Collection. J. H. Keen.

Characters.—Similar to *Mustela caurina*, but larger; rostrum shorter and heavier; dentition heavier; premolars larger and more crowded. Last upper molar similar to that of *Mustela americana*, internal length being more nearly equal to external length than in *caurina*. (See Pl. V.)

Measurements.—Type: Basilar length of Hensel 73; palatal length 39; postpalatal length 34; zygomatic breadth 45.5; width across postorbital processes 23; interorbital constriction 19. Topotype No. 76429, female: Basilar length of Hensel 69; palatal length 37; postpalatal length 32; width across postorbital processes 23; interorbital constriction 15. (*Mustela caurina* No. 87075, female adult, Port Moody, British Columbia: Basilar length of Hensel 64; palatal length 33; postpalatal length 31; zygomatic breadth 41; width across postorbital processes 20; interorbital constriction 15.)

Remarks.—This form is represented by two skulls which Mr. Keen secured several years ago from natives at Massett. These are not sexed, but the difference in size and other slight characters make it evident that one is a young male and the other an adult female. The peculiarities shown by these skulls are so marked that there can be no doubt that they represent an insular species. In the Biological Survey series of nearly 500 skulls of *Mustela americana* and its allies I have been able to find no others showing the characters of these individuals from the Queen Charlotte Islands. The molar teeth of *nesophila* are heavier than in any other form of the group. The audital bullae are actually about the same size as in *caurina* and thus relatively smaller. The maxillary region between the infraorbital foramen and the alveoli of the upper molars is wider and heavier than in *caurina*. The most obvious cranial character, however, and the one which distinguishes *nesophila* from all other members of the *americana* group is the thick, heavy rostrum. When skins are available for comparison they also will doubtless show some slight differences. The fur traders say the Queen Charlotte martens are always light colored and short haired and do not command as high a price as those from the mainland. The Haidas trap more or less for martens

every winter, but the animal is evidently not abundant, for Mr. Tenant's annual receipts seldom exceed forty skins.

***Lutrix lutris* (Linn). Sea Otter.**

Formerly very abundant, but quite rare at present. A few are occasionally taken on the west coast of the islands or off the southern end of Prevost Island. During his cruise about the islands in 1787 Dixon bartered with the Haidas for 1,821 sea-otter skins. He secured a great many in Cloak Bay, on North Island, and describes his experience as follows:¹

A scene now commenced which absolutely beggars all description, and with which we were so overjoyed that we could scarcely believe the evidence of our senses. There were 10 canoes about the ship, which contained, as nearly as I could estimate, 120 people. Many of these brought most beautiful beaver cloaks, others excellent skins, and, in short, none came empty-handed, and the rapidity with which they sold them was a circumstance additionally pleasing. They fairly quarreled with each other about which should sell his cloak first, and some actually threw their furs on board if nobody was at hand to receive them. * * * In less than half an hour we purchased near 300 beaver skins, of an excellent quality. * * * That thou mayest form some idea of the cloaks we purchased here I shall just observe that they generally contain three good sea-otter skins, one of which is cut in two pieces. Afterwards they are neatly sewed together so as to form a square, and are loosely tied about the shoulders with small leather strings, fastened on each side.

At another time, when near either Skidegate or Cumshewa Inlet, under date of July 29, he writes:

Early in the afternoon we saw several canoes coming from shore, and by 3 o'clock we had no less than 18 alongside, containing more than 200 people, chiefly men. This was not only the greatest concourse of traders we had seen, but what rendered the circumstance additionally pleasing was the quantity of excellent furs they brought us, our trade now being equal, if not superior, to what we had met in Cloak Bay, both in the number of skins and the facility with which the natives traded. * * * Besides the large quantity of furs we got from this party (at least 350 skins) they brought several raccoon cloaks, each cloak consisting of 7 raccoon skins neatly sewed together.²

?*Eumetopias stelleri* (Lesson). Steller Sea Lion.

A sea lion, probably this species, is reported. It was not seen by us.

***Otodes³ alascanus⁴* (Jordan and Clark) Alaska Fur Seal.**

Fur seals still occasionally stop on or near the Queen Charlotte Islands. In former days the natives secured a great many in the region off the south end of the group.

¹ A Voyage Round the World in the *King George* and *Queen Charlotte*, pp. 199-234, London, 1789.

² Since raccoons are not found on the Queen Charlotte Islands, these skins were probably from Vancouver Island where the animals are common.

³ Fide Palmer, Proc. Biol. Soc. Wash., XIV, 133-134, Aug. 9, 1901,

⁴ Report Fur Seal Invest. 1896-1897, Pt. 3, pp. 2-3, 1899,



SKULLS OF MUSTELA (NATURAL SIZE).

1, 2. *Mustela caurina*.

3, 4. *Mustela nesophila*.

Phoca largha Pallas. Pacific Harbor Seal.

Harbor seals are quite common. They bobbed up very often near our canoe as we were paddling about the inlets.

Sorex longicauda prevostensis subsp. nov. Prevost Island Shrew.

Type from Prevost Island, Queen Charlotte Islands, British Columbia. ♂ ad. No. 100618, U. S. Nat. Mus., Biological Survey Collection. Collected July 3, 1900, by W. H. Osgood and E. Heller. Orig. No. 1089.

Characters.—Similar to *Sorex longicauda*; tail, relative to head and body, shorter; dental characters distinctive.

Color.—Very slightly darker than *S. longicauda*; contrast between upper and lower parts less; otherwise similar.

Skull.—Size large, equal to *S. longicauda*; dentition slightly lighter; third unicuspid nearly equal to fourth, not about one-half smaller as in *longicauda*.

Measurements.—*Type*: Total length, 133; tail vertebræ, 58; hind foot, 15. Average of 7 topotypes: Total length, 135; tail vertebræ, 55; hind foot, 15; ratio of length of tail to total length, 40.7. (Average of 27 topotypes of *S. longicauda*: Total length, 129; tail vertebræ, 58; hind foot, 15.5; ratio of length of tail to total length, 45.)

Remarks.—The shrews of Prevost Island differ from those of Graham and Moresby islands to a greater degree than from the mainland species *S. longicauda*. In color they are very dark, even averaging darker than *longicauda*; occasional specimens are deep chocolate brown both above and below. On the whole, however, they are very similar to *longicauda*, but the combination of slight characters they show can hardly be explained, except by assuming that they were produced by insular isolation. The case is much like that of *Peromyscus prevostensis*, though not so striking. In both cases the Prevost Island form is distinct from its nearest geographical ally and very closely similar to forms found at a greater distance. The very close relationship of *prevostensis* to *longicauda* seems best indicated by a trinomial name.

This shrew was not particularly abundant on Prevost Island, and only 14 specimens were secured. They were caught in damp, mossy places such as shrews usually inhabit in the northwest coast region.

Sorex longicauda elassodon subsp. nov. Queen Charlotte Shrew.

Type from Cumshewa Inlet, Moresby Island, Queen Charlotte Islands, British Columbia. ♂ yg. ad. No. 100597. U. S. National Museum, Biological Survey Coll. Collected June 13, 1900, by W. H. Osgood and E. Heller. Orig. No. 1030.

Characters.—Similar to *Sorex longicauda*, but smaller and with relatively shorter tail; teeth actually about as in *Sorex obscurus*, relatively much smaller.

Color.—Almost exactly as in *S. longicauda*; lower parts paler than in *prevostensis*.

Skull.—Similar in general to that of *Sorex longicauda*, but somewhat smaller; compared with those of *S. obscurus* the braincase is more elevated and the rostrum more slender and attenuate, the skull in general having a longer and narrower appearance; the teeth are decidedly smaller than in *longicauda*, but about equal to those of *obscurus*, thus being relatively smaller than those of *obscurus*. In the relative size of individual teeth I can find no departure from *longicauda* or *obscurus*.

Measurements.—Type: Total length, 123; tail vertebræ, 52; hind foot, 14. Average of 7 topotypes: Total length, 132; tail vertebræ, 55; hind foot, 14.

Remarks.—The shrews of Moresby and Graham Island are easily separable from *S. prevostensis*, which might be supposed to be their nearest relative. They are very closely related to *S. obscurus* and *S. longicauda*, however, and seem to be intermediate between them. As in the case of *prevostensis*, a trinomial name is proposed for them in order to group them with their very similar relatives.

They were found in abundance on Moresby Island, but for some reason were quite rare at Skidegate, on Graham Island. They have been taken at Massett by Mr. Keen, who reports that they are common there. In the vicinity of Cumshewa Inlet we took 25 specimens, but at Skidegate with equal effort, only one.

***Lasionycteris noctivagans* (Le Conte). Silver-haired Bat.**

A single adult male was taken at Skidegate on the evening of July 10. Another was killed the same evening, but it fell in a dense thicket and could not be retrieved. Others, which by their large size were supposed to be this species, were occasionally seen. The specimen secured was in the deep-brown phase, with but slight silver tipping to the hairs.

I have seen no previous record of the occurrence of the silver-haired bat on the coast north of Puget Sound.

***Myotis yumanensis saturatus* Miller. Sooty Big-footed Bat.**

Bats were very rarely seen in Cumshewa Inlet or in Houston Stewart Channel, near Prevost Island. At Skidegate, however, they were very abundant both about the village and along the edge of the forest. They were most easily secured about the village, and nearly every evening during our stay we spent several hours wandering among the deserted Indian cabins on the lookout for them. Early in the evening they were found flying quite high up along the edge of the forest and over the village; later they were lower down, darting in and out between the houses, never going much above them, and sometimes almost touching the ground. This made them very hard to shoot, but after considerable expenditure of ammunition we obtained representatives of several species. In some cases we secured specimens by striking them to the ground with long switches. Four adult males of

Myotis yumanensis saturatus were taken, and many other bats apparently of this subspecies were seen. It appears to be the most abundant bat at Skidegate. The specimens seem to be perfectly typical and can easily be matched by others from the Puget Sound region. The species has not been previously recorded from the Queen Charlotte Islands.

***Myotis subulatus keeni* (Merriam). Keen Bat.**

This bat was originally described by Dr. C. Hart Merriam in 1895, from specimens collected at Massett by Rev. J. H. Keen. The type and three other alcoholic specimens are at present in the Biological Survey collection. Although no bat of the *subulatus* type has as yet been found elsewhere on the west coast, it does not seem probable that this form is peculiar to the Queen Charlotte Islands, and its capture on the adjacent mainland will probably occur before many years have passed. Strange to say, this bat was not taken by us at Skidegate.

***Myotis californicus caurinus* Miller. Northwest Bat.**

This subspecies was described by Mr. G. S. Miller, jr., from specimens taken in 1895 by Rev. J. H. Keen. The type and eight topotypes in alcohol are now in the Biological Survey collection. Three specimens, one male and two females, taken at Skidegate July 10-12, are slightly darker than specimens from Mount Rainier and Ashford, Washington, and doubtless represent the extreme development of the form.

BIRDS OF THE QUEEN CHARLOTTE ISLANDS.

Gavia imber (Gunn). Loon.

Rather common about all the islands. Its cry when heard at night in one of the narrow, closely walled inlets is even more weird and mournful than usual.

Gavia pacifica (Lawr.). Pacific Loon.

Several were seen at Skidegate July 9.

Gavia lumme (Gunn). Red-throated Loon.

A pair of red-throated loons were seen flying down Cumshewa Inlet June 27.

Lunda cirrhata Pallas. Tufted Puffin.

Often seen flying in Hecate Strait. A moderate-sized breeding colony was found on an islet in Houston Stewart Channel. One specimen taken July 5.

Fratercula corniculata (Naum). Horned Puffin.

Recorded from Massett, Graham Island, by Mr. John Fannin, on the authority of Mr. Keen;¹ also mentioned by Chamberlain.²

Synthliboramphus antiquus (Gmelin). Ancient Murrelet.

Seen at Massett by Mr. Keen; not seen by us.

Brachyramphus marmoratus (Gmelin). Marbled Murrelet.

Occasionally seen in Cumshewa and Skidegate inlets.

Cephus columba Pallas. Pigeon Guillemot.

This is the most abundant water bird about the islands. It breeds in crevices of the rocks along the shores of quiet inlets. In many of these places the branches of the trees overhang the rocks and almost touch the water at high tide, so that when the birds are startled from their nests it is possible to observe the strange circumstance of a guillemot flying out of a tree. In frequent instances nesting sites are chosen in and about clefts of the rocks under the roots of large trees.

Uria troile californica (Bryant). California Murre.

Several were seen in Hecate Strait a few miles off the mouth of Cumshewa Inlet July 1; they were apparently directing their course

¹ Preliminary Catalogue of Collections in the Provincial Museum, Victoria, British Columbia, p. 16, 1898.

² Catalogue of Canadian Birds, p. 4, 1887.

for the Skedans Islands at the mouth of the inlet, where they probably breed.

Rissa tridactyla pollicaris Ridgw. Pacific Kittiwake.

According to Mr. John Fannin, this bird was taken at the islands September, 1895, by Dr. C. F. Newcombe.¹ It was not seen by us.

Larus glaucescens Naum. Glaucous-winged Gull.

A breeding colony of about 100 of these gulls was found on an islet in Houston Stewart Channel. Fresh eggs, as well as young just hatched, were observed there July 3. Very few large gulls were seen elsewhere about the islands, but they are said to breed in numbers on the west coast of Moresby Island.

Larus brachyrhynchus Rich. Short-billed Gull.

Mentioned by Chamberlain.²

Larus philadelphia (Ord). Bonaparte Gull.

A few small gulls supposed to be this species were seen.

Puffinus griseus (Gmelin). Dark-bodied Shearwater.

Shearwaters supposed to be this species were seen in large flocks in Hecate Strait a few miles off Moresby Island, July 1-8. Reported in great numbers off the west coast of the islands in the fall of 1895, by Dr. C. F. Newcombe.³

Puffinus tenuirostris (Temm.). Slender-billed Shearwater.

Shot off the coast of Queen Charlotte Islands, by Dr. C. F. Newcombe, in August, 1894.⁴

Oceanodroma furcata (Gmelin). Forked-tailed Petrel.

A few small petrels supposed to be this species were seen in Hecate Strait, July 1-8.

Phalacrocorax pelagicus Pallas. Pelagic Cormorant.

Frequently seen. A few breed on the Skedans Islands off the mouth of Cumshewa Inlet, and on some of the islets off the west coast of Prevost Island.

Merganser americanus (Cassin). American Merganser.

A large merganser is abundant and evidently breeds. Mr. Keen reports both this species and the following:

Merganser serrator (Linn.). Red-breasted Merganser.

Reported by Mr. Keen. Not positively identified among those seen by us.

¹Preliminary Catalogue Provincial Museum, Victoria, B. C., p. 17, 1898.

²Catalogue of Canadian Birds, p. 10, 1887.

³Fannin, Preliminary Catalogue Provincial Museum, Victoria, B. C., p. 17, 1898.

⁴Macoun, Catalogue of Canadian Birds, Part I, p. 61, 1900.

Anas boschas Linn. Mallard.

A flock of about a dozen mallards was seen frequently about the head of Cumshewa Inlet, June 17-26.

Mareca americana (Gmelin). Baldpate.

Reported by Mr. Keen.

Nettion carolinensis (Gmelin). Green-winged Teal.

Given in Mr. Keen's Massett notes. Not seen by us.

Dafila acuta (Linn.). Pintail.

Reported by Mr. Keen. Not seen by us.

Aythya sp. ?

Scaup ducks were several times seen flying at a distance.

Clangula clangula americana (Bonap.). American Golden-eye.

Included in Mr. Keen's Massett list. Not seen by us.

Charitonetta albeola (Linn.). Bufflehead.

Seen at Massett (Keen).

Harelda hyemalis (Linn.). Old-squaw.

A roughly stuffed skin of an adult male old-squaw was seen at an Indian village in Cumshewa Inlet.

Histrionicus histrionicus (Linn.). Harlequin Duck.

Said to occur at Massett (Keen).

Oidemia deglandi Bonap. White-winged Scoter.

Frequently seen in Cumshewa and Skidegate inlets.

Oidemia perspicillata (Linn.). Surf Scoter.

Common.

Anser albifrons gambeli (Hartl.). American White-fronted Goose.

Reported by Mr. Keen.

Branta canadensis occidentalis (Baird). White-cheeked Goose.

Six or seven were seen crossing Cumshewa Inlet June 16.

Olor sp. ?

Swans are said to have been taken frequently.

Ardea herodias fannini Chapman.¹ Northwest Coast Heron.

Often seen feeding at low tide on the beaches and mud flats of Skidegate and Cumshewa inlets. No specimens taken.

Porzana carolina (Linn.). Sora Rail.

Included in Mr. Keen's manuscript list of birds seen at Massett.

¹Bul. Am. Mus. Nat. Hist. XIV, 87-90, Apr. 15, 1901.

Gallinago delicata (Ord). Wilson Snipe.

Reported by Mr. Keen.

Tringa acuminata (Horsf.). Sharp-tailed Sandpiper.

Taken at Massett, Graham Island, December 27, 1897, by Rev. J. H. Keen.¹ Mr. Keen kindly forwarded me the specimen on which this record was made. I have compared it with others of the same species and found it typical.

Ereunetes occidentalis Lawr. Western Sandpiper.

A small sandpiper supposed to be this species was seen on a beach in Cumshewa Inlet, June 28. Mr. Keen reports its occurrence at Massett.

Calidris arenaria (Linn.). Sanderling.

Reported by Mr. Keen.

Totanus melanoleucus (Gmelin). Greater Yellowlegs.

Two were seen and one of them taken on the beach at Skidegate, July 17.

Actitis macularia (Linn.). Spotted Sandpiper.

One seen at Skidegate in July.

Squatarola squatarola (Linn.). Black-bellied Plover.

Reported by Mr. Keen.

Charadrius dominicus Müller. American Golden Plover.

Reported by Mr. Keen.

Arenaria melanocephala (Vigors). Black Turnstone.

A flock of 6 was seen near Lina Island, Skidegate Inlet, July 12.

Hæmatopus bachmani Aud. Black Oystercatcher.

Abundant. The shrill cries of the oystercatchers were heard about the inlets at all hours of day or night. Nearly every outlying rocky islet was occupied by a pair of 'sandpipers,' as they are locally called, and whenever a boat approached both birds would circle about it for some time, flying close to the water and crying shrilly. Dr. Robert Brown, writing in 1869,² says of this species:

About Queen Charlotte Islands it is very plentiful. In March, 1866, while rowing along the narrow sounds among these islands we often saw it. It would sit on the rocks until we could almost touch it; then, uttering a low whistling cry, it would dart off to another skerry, repeating the same maneuver over and over again.

A nest found in Cumshewa Inlet, June 17, was merely a hollow about 2 inches deep and almost perfectly round, scooped out of a weedy turf a few feet above high-water mark. The bottom of the hollow was covered with bits of broken stone, evidently placed there by the old

¹ Fannin, Preliminary Catalogue Provincial Museum, Victoria, B. C., p. 28, 1898.

² Ibis, IV, 424, 1868.

bird. A few feet from the nest a downy young bird was discovered squatting in the weeds and gravel. It may be described as follows: Upperparts chiefly mottled olive-gray and black, the gray predominating and the black distributed mainly in an ill-defined patch on the back of the head and two prominent parallel stripes that extend from the nape down the middle of the back to the rump; middle of back with a little buffy-tipped down; wings like back but with more buffy; flanks spotted with black; throat and breast slate gray, darker on sides of neck and indistinctly patched with paler on middle of throat; a conspicuous white spot far back on middle of breast with a white line extending forward from it on each side to the vicinity of the axillars; abdomen paler than breast and lightly washed with buffy, also having to some degree the vermiculated appearance of the upperparts.

***Dendragapus obscurus fuliginosus* Ridgw.** Sooty Grouse.

Several were heard booming about Cumshewa Inlet early in June. A pair of adult birds was taken at an altitude of about 3,000 feet in the mountains at the head of Cumshewa Inlet June 23.

[*Bonasa umbellus sabini* (Dougl.). Oregon Ruffed Grouse.

In Macoun's Catalogue of Canadian Birds the following statement occurs under *Bonasa u. sabini*:

"One of the most abundant birds of the coast region of British Columbia including all the islands in the Gulf of Georgia, Vancouver Island, and *Queen Charlotte Islands*."

We did not meet this bird anywhere on the Queen Charlottes and it is not mentioned in Mr. Keen's manuscript list, so it seems probable that this statement is erroneous.]

? *Lagopus* sp.

I was told by Mr. Tennant, of Skidegate, that eight 'white grouse' were killed several years ago by a party of prospectors in the mountains on Graham Island a few miles from Anchor Cove, Skidegate Inlet. We found conditions favorable for ptarmigan near the summit of the mountains about the head of Cumshewa Inlet, but did not see any during our short stay there.

***Zenaidura macroura* (Linn.).** Mourning Dove.

Seen at Massett by Mr. Keen; not observed by us.

***Accipiter velox* (Wils.).** Sharp-shinned Hawk.

Two small hawks supposed to be this species were seen at Skidegate July 12. Mr. Keen reports its occurrence at Massett.

***Accipiter atricapillus striatulus* Ridgw.** Western Goshawk.

Seen at Massett (Keen).

***Buteo borealis calurus* (Cassin).** Western Red-tailed Hawk.

A solitary red tail was seen flying near the head of Cumshewa Inlet June 22; no others were seen during our visit.

***Haliaetus leucocephalus alascanus* Towns.** Northern Bald Eagle.

Very common; often seen in parties of from 2 to 10 individuals, the majority being birds of the year. They seem to feed largely on mollusks and crustaceans, which are very abundant. At one time I saw seven huge birds clumsily hopping over the rocks on the shore evidently looking for crabs. Eagles' nests were occasionally noted in the tops of tall, partially dead trees.

***Falco peregrinus pealei* Ridgw.** Peale Falcon.

An immature female was taken July 2. It was shot as it circled around the small schooner in which we were drifting in Hecate Strait a few miles off Scudder Point, Burnaby Island. Several others were seen near Prevost Island, and while we were in Houston Stewart Channel a pair of them had daily altercations with a bald eagle in the tops of the trees on an islet near our anchorage.

***Falco columbarius suckleyi* Ridgw.** Black Merlin.

A small dark hawk was indistinctly seen flitting out from the top of a tall spruce in Cumsheewa Inlet June 14. Mr. Keen reports the black merlin from Massett.

***Pandion haliaetus carolinensis* (Gmelin).** American Osprey.

Ospreys were not seen by us, but they are evidently common in some parts of the islands, as we heard numerous reports of them. Mr. Keen has noted their spring arrival at Massett as follows: 1894, May 13; 1896, April 24; 1897, May 12; 1898, April 30.

***Megascops asio kennicotti* (Elliot).** Kennicott Screech Owl.

Seen at Massett (Keen).

***Nyctala*¹ *acadica scotæa*² subsp. nov.** Northwest Saw-whet Owl.

Type from Massett, Queen Charlotte Island, British Columbia, ♂ ad. No. 168171, U. S. National Museum, Biological Survey collection. Collected December 19, 1896, by J. H. Keen.

Characters.—Similar to *N. acadica*, but darker both above and below, dark markings everywhere heavier; flanks, legs, and feet more rufescent.

Color.—Upperparts, including head, neck, back, and upper tail-coverts, mummy brown;³ head with light stripes on forehead and thence down sides of neck; neck and interscapulars irregularly marked with white; wings slightly lighter than back; five outer primaries with two to four white spots on outer and inner webs; inner prima-

¹ Dr. C. W. Richmond has proposed the name *Cryptoglaux* as a substitute for *Nyctala* on the ground that the latter is preoccupied by *Nyctalus* (cf. Auk, XVIII, 193, April, 1901). This disposition of *Nyctala* seems reasonable, but *Cryptoglaux* is not used here, since it has not been adopted by the American Ornithologists' Union.

² *Scotæa*=dark, dusky.

³ The color names used are from Ridgway's Nomenclature of Colors.

ries and secondaries with white spots on inner webs only; tail pale clove brown, narrowly tipped with white, webs of rectrices crossed by three white bars; auriculars isabella color streaked with dusky; forehead and superciliary region white; orbital ring and outer feathers of lores sooty; chin, throat, and upper breast white, interrupted by a collar of mars brown; lower breast and abdomen white, heavily streaked with walnut brown; sides, flanks, legs, and feet clear ochraceous buff.

Measurements.—Type: Wing 85; tail 69; tarsus 26.

Remarks.—This dark-colored form of the Acadian owl doubtless ranges throughout the humid Pacific coast region. Its rarity probably accounts for its having been previously overlooked, for its characters are in general the same as those of the numerous other forms peculiar to the same region, which have long been recognized in nomenclature. The only specimens that I have examined beside the type are several imperfect ones from Puget Sound, which are in the National Museum collection. These agree with the type in richness of color and extent of dark markings. The type was collected by Rev. J. H. Keen, who very generously presented it to the Biological Survey collection. A small owl, apparently this species, flew over our vessel at 11 o'clock on the night of July 4, while we were at anchor in Houston Stewart Channel. This was the only owl seen at any time during our visit to the islands.

Nyctea nyctea (Linn.). Snowy Owl.

Mr. Tennant says he has killed large white owls at Skidegate. Mr. Keen reports them from Massett.

Ceryle alcyon (Linn.). Belted Kingfisher.

Generally found along the larger streams. One specimen was taken June 21.

Dryobates picoides sp. nov. Queen Charlotte Woodpecker.

Type from Cumsheewa Inlet, Moresby Island, Queen Charlotte Islands, British Columbia. ♀ ad., No. 166816, U. S. Nat. Mus., Biological Survey collection. Collected June 15, 1900, by W. H. Osgood and E. Heller. Orig. No. 386.

Characters.—Similar in general to *Dryobates v. harrisi*; bill slightly smaller; middle of back barred and spotted with black; flanks streaked with black.

Description.—Top of head, wings, and tail black; middle of back from nape to rump white, heavily barred, or spotted with black (streaked in immature specimens), primaries and secondaries more or less spotted with white; coverts usually with two to four elongate white spots; underparts smoky brownish, deepest on breast; flanks streaked, barred, or spotted with black and dusky (this sometimes extending forward on sides to axillars); three outer tail-feathers white, the innermost always partially black, the others sometimes more or less barred with black.

Measurements.—The Queen Charlotte specimens have rather smaller bills than *harrisi*, as appears from the following table:

DRYOBATES PICOIDEUS.

Number.	Sex.	Locality.	Wing.	Tail.	Exposed culmen.	Tarsus.
166816..	♀ ad....	Queen Charlotte Islands, British Columbia (type).	126	94	29	23
166821..	♀ ad....	.....do.....	120	96	28.5	22
166820..	♀ im....	.....do.....	125	96	27.5	22
166818..	♀ im....	.....do.....	124	95	24	22
166817..	♂ im....	.....do.....	121	98	28.5	23
166819..	♂ im....	.....do.....	122	99	29.5	21.5

DRYOBATES VILLOSUM HARRISI.

157586..	♂ ad....	Neah Bay, Washington.....	123	97	34	23
157619..	♂ ad....	.....do.....	126	99	36	24
157598..	♂ ad....	.....do.....	129	102	35	23
117699..	♀ ad....	Departure Bay, British Columbia.....	123	85	30	21
151483..	♀ ad....	Comox, British Columbia.....	123	95	31	22.5
132504..	♀ ad....	Seattle, Washington.....	121	97	32	22

Remarks.—Adult specimens of *Dryobates picoides* are easily distinguishable from all other members of the *villosus* group by the black markings on the back. Immature birds of *harrisi* and of other members of the group occasionally have a few median or lateral streaks of black on the back, but never the definite barring, as in *picoideus*. There is also an occasional tendency in young *harrisi* to show dusky on the flanks, but neither this nor the black in the back persists in the adult. This woodpecker is not abundant on the islands; during our stay we saw but six, all of which were secured. These consist of two adult females, two immature females, and two immature males. The only adult male examined was one brought to me by a boy at Skidegate, which was not preserved, as it was very much mutilated, but its characters, particularly the barred back, were noted.

Sphyrapicus ruber flaviventris (Vieill.). Northern Red-breasted Sapsucker.

Picus flaviventris Vieillot, Ois. Am. Sept., II, 67, 1807.

Sphyrapicus varius ruber Grinnell, Condor, III, 12, Jan. 15, 1901.

Common. Represented by ten specimens, which agree perfectly with birds from Vancouver Island and the mainland of British Columbia. This bird was discovered by Captain Cook in Nootka Sound on the west coast of Vancouver Island. In the narrative of his famous voyage he makes special mention of it and gives a very good description. Later, in 1807, Vieillot named it *Picus flaviventris*, and distinguished it from *Picus ruber* of Gmelin as follows:

‘Diffère principalement par la teinte du ventre qui est d’un jaune olivâtre.’

Colaptes cafer saturator (Ridgw.). Northwestern Flicker.

Apparently quite rare, as we saw none. A few unmistakable tail feathers were found, however, by Heller in Cumshewa Inlet. Mr. Keen reports flickers abundant near Massett.

Selasphorus rufus (Gmelin). Rufous Hummingbird.

Common. During the month of June hummers were often seen visiting the abundant blossoms of *Lonicera involucrata*. Mr. Keen has observed their arrival at Massett for six years as follows: 1891, April 6; 1892, April 21; 1893, April 29; 1894, April 2; 1895, April 11; 1896, April 15.

Empidonax difficilis Baird. Western Flycatcher.

Rather common, but very shy and difficult to secure. Represented by two adult females from Cumshewa Inlet. Mr. Keen has noted its spring arrival at Massett as follows: 1892, May 15; 1894, May 20.

Cyanocitta stelleri carlottæ subsp. nov. Queen Charlotte Jay.

Type from Cumshewa Inlet, Moresby Island, Queen Charlotte Islands, British Columbia. ♂ ad., No. 166822, U. S. Nat. Mus., Biological Survey collection. Collected June 17, 1900, by W. H. Osgood and E. Heller. Orig. No. 400.

Characters.—Similar to *C. stelleri*, but larger and darker colored; abdomen and flanks deep Berlin blue instead of Antwerp or China blue as in *C. stelleri*; frontal spots much reduced; black of head extending on breast and merging into blue of abdomen without sharp demarcation.

Color.—Head, neck, and back deep dull black (bluish black in some specimens and very slightly brownish in others); forehead with very slight blue spots or immaculate; upper parts of wings and tail deep Berlin blue; inner secondaries and tip of tail with black bars of varying distinctness; rump and upper tail-coverts Paris blue; throat and neck black or brownish black; breast Berlin blue becoming slightly paler on flanks and crissum.

Measurements.—Type: Total length 350; extent 483; (length and extent measured in flesh) wing 153; tail 155; exposed culmen 32.5; tarsus 49. Average of three adult males from the type locality: Wing 155; tail 154; culmen 32; tarsus 49. (Average of six adult males of *C. stelleri* from Puget Sound: Wing 147; tail 147; culmen 30; tarsus 45.)

Remarks.—The large size and dark color of this jay were noticed in the field, and subsequent comparison of specimens in the museum showed these characters to be amply sufficient to distinguish it from the mainland form *C. stelleri*. It is accorded only subspecific rank because its derivation from the mainland form is scarcely to be doubted, and because individual variation in *C. stelleri* occasionally approaches the condition of *C. s. carlottæ*. It is represented in the collection by four adult and four immature birds, all but one of which were taken about Cumshewa Inlet. Jays are not very common on the islands. They were seen only occasionally and were generally in family parties of four to six adults and young.

Corvus corax principalis Ridgway. Northern Raven.

Very abundant. During June the majority of those seen were young birds of the year which were easily distinguishable by their juvenile

manners and ludicrous colloquial attempts. I frequently watched them feeding on crabs. The general method of procedure seemed to be for one raven to catch a small crab on the shore and then retire to a log or the top of a stump, a few rods back in the forest, to eat it. While he was enjoying the tidbit several of his companions would perch in the trees near by preening themselves and making vigorous comments now and then until it was time to return to the beach for another morsel.

Corvus caurinus Baird. Northwest Crow.

Not common. A flock of about thirty was seen several times near the head of Cumshewa Inlet.

Pinicola enucleator flammula (Homeyer). Kadiak Pine Grosbeak.

A small flock of pine grosbeaks was seen in Cumshewa Inlet June 16, and one immature male was taken. No others were seen during our stay.

Loxia curvirostra minor (Brehm.). American Crossbill.

Large flocks of crossbills were seen frequently, but as none came within range of our guns, no specimens were secured. Mr. Keen reports this species from Massett.

Loxia leucoptera Gmelin. White-winged Crossbill.

Mr. Keen found this species at Massett. We were unable to distinguish species among the many crossbills that we saw in other parts of the islands.

Spinus pinus (Wilson). Pine Siskin.

Heard occasionally; no specimens taken. Seen at Massett by Mr. Keen.

Passerina nivalis (Linn.). Snowflake.

Seen at Massett by Mr. Keen.

Ammodramus sandwichensis alaudinus (Bonap.). Western Savanna Sparrow.

Reported from Massett by Mr. Keen; not seen by us.

Calcarius lapponicus alascensis Ridgw. Alaska Longspur.

Seen at Massett by Mr. Keen.

Zonotrichia coronata (Pallas). Golden-crowned Sparrow

Said to occur at Massett (Keen).

Junco hyemalis oregonus (Towns.). Oregon Junco.

Not common. It was very seldom seen near the coast and but few were noticed on the mountains. Although great pains were taken to secure every specimen seen, our total was but seven, and three of these were immature birds. If the junco that breeds at Sitka be considered typical *oregonus*, the Queen Charlotte birds are easily referable to this form. They seem to be identical in color, and the measurements differ too slightly to be of consequence.

Melospiza melodia rufina (Bonap.). Sooty Song Sparrow.

Very abundant. Their favorite haunts are the dense *Rubus* thickets along the shore, whence they occasionally wander out on the rocks and sandy beaches in search of insects and sand fleas. Hour after hour they sit swinging on the slender topmost twigs of the salmon-berry bushes and look out over the water while they pour forth a jubilant ringing song. In some of the few open grassy places they were particularly numerous, and in skulking through the weeds frequently came to grief by encountering our mouse traps.

A nest which Heller found in Cumsheewa Inlet June 24, was situated on the ground in a bunch of weeds near the water's edge. It contained two fresh eggs, which dissection of the female bird showed to be a complete clutch, though undoubtedly a second laying, as fledged young were abundant at that time. Another nest, which I stumbled upon near Skidegate July 14, was placed in much the same kind of situation and contained three fresh eggs. These eggs are slightly smaller than those of *Melospiza m. insignis* in the National Museum, but otherwise very similar. They measure as follows: 22.6 x 16.7, 22.7 x 16.8, 23 x 16.7, 22.8 x 16, 22 x 16.4.

I have seen very few specimens of typical *M. m. rufina* from Sitka, but have little hesitancy in referring the Queen Charlotte bird to this form. There seems to be no appreciable difference in color and very little, if any, in size. The measurements of 12 males from the Queen Charlotte Islands average as follows: Wing 73, tail 69.5, exposed culmen 14.7, tarsus 24.6. Average of 6 females: Wing 68.5, tail 64, exposed culmen 14, tarsus 23.7.

Passerella iliaca townsendi (Nutt.). Townsend Fox Sparrow.

Common, but, as usual, exceedingly shy. Occasionally a bird would be seen pouring out a wealth of song from the top of an alder or willow near the shore, but more frequently they skulked away through the brush before one could get a fair sight of them. Represented by 10 specimens, 6 adult and 4 immature. These are not identical with breeding birds from Sitka, and perhaps should be considered intermediate between *townsendi* and *fuliginosa*. The young particularly are more dusky than young from Sitka. In the adults the spotting on the lower parts is heavier and duskier and in general there is less of the deep rufescent shades than in typical *townsendi*.

Hirundo erythrogastra Bodd. Barn Swallow.

A few barn swallows were always found about the numerous deserted Indian villages and their nests were frequently noticed on the big cedar beams which are the framework of the Haida houses. Only one specimen was secured, and this is evidently not full grown, as the tail is not as long nor the color as rich as in the fully adult western birds I have examined.

***Tachycineta bicolor* (Vieill.).** Tree Swallow.

One or two swallows supposed to be this species were seen among the barn swallows in Cumshewa Inlet. Mr. Keen reports it from Massett, and has noted the time of its spring arrival as follows: 1891, April 30; 1892, April 24; 1893, May 12; 1895, May 3; 1896, April 7; 1897, April 15; 1898, April 27.

***Tachycineta thalassina* (Swains.).** Violet-green Swallow.

A bird thought to be this species was seen by Heller in Cumshewa Inlet June 30.

***Helminthophila celata lutescens* (Ridgw.).** Lutescent Warbler.

Occasionally seen or heard. Two specimens were taken in Cumshewa Inlet June 15.

***Dendroica aestiva rubiginosa* (Pallas).** Alaska Yellow Warbler.

Rather rare; seen twice in Cumshewa Inlet. Reported by Mr. Keen from Massett.

***Dendroica townsendi* (Townsend).** Townsend Warbler.

One taken in Cumshewa Inlet June 15, and five at Skidegate July 14; very few others seen. Mr. Keen found it at Massett, and noted its spring arrival there as follows: 1891, May 30; 1893, April 28; 1894, May 15; 1896, April 20; 1898, April 17.

***Wilsonia pusilla pileolata* (Pallas).** Pileolated Warbler.

Two specimens were taken and several seen in the mountains near the head of Cumshewa Inlet June 22-24. They were not seen elsewhere, but the species is noted in Keen's Massett list.

? *Anthus pensilvanicus* (Latham). American Pipit.

A bird thought to be this species was seen on a snow field in the mountains of Moresby Island June 23.

***Cinclus mexicanus* Swains.** American Dipper.

A dipper was seen and heard several times along a stream emptying into West Arm of Cumshewa Inlet.

***Anorthura hiemalis pacifica* (Baird).** Western Winter Wren.

Very common on all the islands. It is practically the only bird to be found in the deep forest away from the seashore. On the occasions when we attempted to penetrate the labyrinth of undergrowth toward the interior of the islands, we were always greeted, even in the darkest places, by the tiny wren's bright bubbling song or scolding chatter. It is always in motion and utterly regardless of the weather. During continuous rains while we were camped at the head of Cumshewa Inlet a wren would appear every few hours near the front of the tent

and, after scolding us for awhile, move on through the wet brush cheerfully and oblivious of the drenching rain.

I flushed a bird from an empty nest in the upturned roots of a large fallen cedar June 15. I visited this nest frequently and flushed the bird from it each time, but up to June 28 it still contained no eggs.

Four specimens only were collected, two adults and one young from Cumshewa Inlet, and one young from Skidegate. These do not differ from specimens from the adjacent mainland of British Columbia and from Puget Sound near the type locality of *Anorthura h. pacifica*.

Certhia familiaris occidentalis Ridgw. Western Creeper.

One specimen was taken and several others were seen in Cumshewa Inlet June 20.

Sitta canadensis Linn. Red-breasted Nuthatch.

Two specimens were taken in Cumshewa Inlet June 18 and June 22, respectively. No others were seen during our stay.

Parus rufescens Towns. Chestnut-backed Chickadee.

Abundant. Seven specimens were taken.

Regulus satrapa olivaceus Baird. Western Golden-crowned Kinglet.

Common. An adult male was taken in Cumshewa Inlet June 20.

Regulus calendula grinnelli Wm. Palmer. Sitka Kinglet.

Reported by Mr. Keen. Not seen by us.

Hylocichla ustulata (Nutt.). Russet-backed Thrush.

Common. Eight specimens were taken in various parts of the islands. It was very abundant at Clew on the north side of Cumshewa Inlet, but was not seen at all at our camp at the head of the inlet, where we found *H. a. verecunda*. Mr. Keen found it common at Massett, and noted its annual arrival for seven years as follows: 1891, May 29; 1892, May 23; 1893, May 17; 1894, May 19; 1895, April 25, 1896, April 11; 1898, April 26.

Hylocichla aonalaschkæ verecunda Osgood.¹ Coast Hermit Thrush.

Rather rare. Two adult females were taken at the head of Cumshewa Inlet, and one male at Prevost Island. These Queen Charlotte specimens have the extreme development of the characters of this form, being rich brownish olivaceous, although in breeding plumage.

Merula migratoria propinqua Ridgw. Western Robin.

Common. No specimens preserved. Mr. Keen notes the spring arrival of the robin at Massett as follows: 1891, March 12; 1892, March 16; 1893, March 6; 1894, February 20; 1895, March 1; 1896, February 21; 1898, February 24.

Hesperocichla nævia (Gmelin). Varied Thrush.

Occasionally seen or heard. Seen at Massett (Keen).

¹ Auk, XVIII, 183, April, 1901.

NATURAL HISTORY OF THE COOK INLET REGION, ALASKA.

By WILFRED H. OSGOOD.

INTRODUCTION AND ITINERARY.

The region about Cook Inlet was, at the beginning of the field season of 1900, the only general district of consequence on the Pacific coast of Alaska that had not been recently visited by naturalists. The important bearing which collections from this region would have on problems connected with the general natural history of Alaska was strongly realized, and, accordingly, after the completion of work on the coast farther south, I was directed to proceed to Cook Inlet and make as thorough a biological reconnoissance of the region as time and circumstances would permit. On this trip, as earlier in the season, I had the efficient assistance of Mr. Edmund Heller. We entered the region August 21, making stops of a few hours each at Seldovia and Homer on the southwestern end of the Kenai Peninsula. From Homer we continued up the inlet and into Turnagain Arm, and landed at the mining camp of Hope City August 23. The lower coast country about Hope occupied us until August 31, when we moved on into the mountains at the head of Bear Creek, a medium-sized stream that empties into Turnagain Arm near Hope. A week later we left Turnagain Arm for the northwest side of the inlet at Tyonek, and there spent the remaining time from September 13 to September 28. From this it may be seen that most of the work was done in but two general localities, the vicinity of Hope and the vicinity of Tyonek. Short stops at Seldovia, Homer, Kenai, and Sunrise, however, were of considerable value, and information received from prospectors gave some general information about the Knik and Sushitna districts. If more time had been available it could doubtless have been spent profitably in these districts. The vicinity of Seldovia also seemed promising, but we were obliged to pass it by on our way into the inlet and could not return to it.

PHYSIOGRAPHY.

Cook Inlet is the first important indentation of the Alaskan coast east of the Alaska Peninsula. It is a long narrow inlet bifurcated at its upper end into two large arms, Knik Arm and Turnagain Arm. The first of these, Knik Arm, is about 15 miles long, and at its upper

end receives the waters of a large stream, the Matanuska. The other, Turnagain Arm, is 30 miles or more in length, and extends inland until within about 5 miles of the waters of Prince William Sound. West of Knik Arm is the delta of the Sushitna River, the largest stream emptying into the inlet. South of Turnagain Arm, and connected with the mainland only by the 5 miles of glacier between the head of the arm and Prince William Sound, is the Kenai Peninsula. Numerous relatively small streams enter both sides of Turnagain Arm and both sides of the main inlet as well, so that in addition to the great volume received from the Sushitna there is a large secondary supply of fresh water. This abundance of fresh water, much of which carries quantities of silt in suspension, makes the inlet unsuitable for an extensive marine fauna. The tides are very strong and the rise and fall very great, particularly in Knik and Turnagain Arms, where the flood is accompanied by a bore. Navigation by either large or small craft is difficult and often dangerous.

Except in Turnagain Arm, the country bordering Cook Inlet is low and comparatively level, though high mountains from 10 to 60 miles inland can be seen on all sides. The upper end of the main inlet, in the region of the Sushitna delta, is of course low and more or less swampy. The east shore along the Kenai Peninsula, from the mouth of Turnagain Arm nearly to Kachemak Bay, is also low and comparatively flat, but is for the most part heavily wooded. The northwest side from Mount Sushitna, near the mouth of the Sushitna River, westward for nearly 100 miles consists of a slightly rolling coastal plain, varying possibly from 20 to 60 miles in width. This country is broken here and there by rather sluggish streams, most of which head in the mountains farther back or in the small lakes which abound between the coast and the mountains. The small trading station and native village of Tyonek is situated on a low sandspit at the base of this plain about 20 miles west of the mouth of the Sushitna. About Turnagain Arm the mountains reach the coast, and except for a few small tide flats at the mouths of relatively narrow valleys, the shore is steep. Hope City, in the vicinity of which our work in Turnagain Arm was done, is situated at the mouth of Resurrection Creek, a stream of sufficient size to have made quite a wide cut through the mountains. On each side of Resurrection Creek rugged mountains rise to an altitude of 5,000 feet or more and from their canyons many small rushing streams pour into Resurrection Creek or Turnagain Arm near Hope. Bear Creek (see Pl. VI, fig. 2) and Palmer Creek, which come from the east side, are the most important of these.

Although the region north and east of Cook Inlet is exceedingly mountainous and quite imperfectly known, it is evident that there is a gap of some consequence between the Coast or Saint Elias Range, which practically culminates in the upper Matanuska region, and the



FIG. 1.—PEAT BOG AND MIXED WOODS NEAR TYONEK.

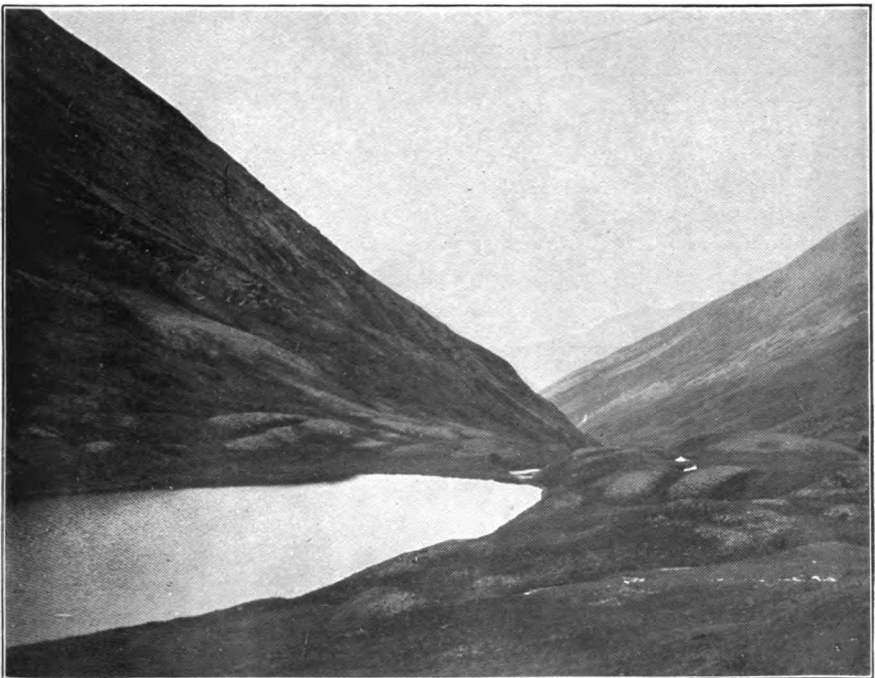


FIG. 2.—LOOKING TOWARD TURNAGAIN ARM FROM HEAD OF BEAN CREEK.

so-called Alaskan Range which lies north and northwest of the inlet and includes the lofty peak of Mount McKinley. The effectiveness of this gap in its relation to the geographic distribution of animals and plants is of great interest.

FLORA.

The flora of the Cook Inlet region is quite different in its general character from that of the coast farther south, although many species are common to both regions. The difference is largely in the reduction of the number of coniferous trees in the Cook Inlet region and the corresponding increase in deciduous trees; but other features somewhat transitional between the heavy saturated forest of the southern coast and the treeless tundra of the north are numerous. The flora of the mountainous district about Turnagain Arm is, of course, different from that of the coastal plains of other parts of the inlet. The low country near Hope consists of a grassy tide flat, about 50 acres in extent, and a few miles of forest and occasional small swamps along the lower part of Resurrection Creek. Balsam poplars, paper birches, alders, and willows abound near the streams, and spruces (*Picea canadensis* and *Picea sitchensis*) and hemlocks (*Tsuga mertensiana*) are common on the slopes and slightly elevated flats. A third species of spruce (*Picea mariana*) is found in the small peat bogs, where smaller Hudsonian plants, such as Labrador tea (*Ledum*), crowberry (*Empetrum*), and dwarf birch (*Betula glandulosa*) are in profusion. The hemlock is much the most abundant of the large trees, but it is exceeded in individual size by the spruces. The conifers ascend the mountain slopes to about 2,000 feet but above that point rapidly disappear. Beyond this elevation are alder thickets, small patches of dwarf willows and birches, and vast stretches of waving grass from 1 to 3 feet high. Still higher, the slopes and rounded backs of the ridges are cushioned with a mass of heather and heather-like shrubs, chiefly *Empetrum nigrum*. This extends up to an approximate altitude of 5,000 feet, above which there is very little or no plant growth. The whole country is characterized by the abundance of high grass; otherwise it is a typical Hudsonian-Alpine region.

The flora on the northwest side of the inlet in the vicinity of Tyonek is somewhat different in character. With the exception of considerable areas occupied by lakes and peat bogs, the whole country is covered with comparatively open forest (see Pl. VI, fig. 1). Deciduous trees greatly outnumber conifers, of which but two species occur, *Picea canadensis* and *Picea mariana*, and one of these, *P. mariana*, is quite rare and local. The paper birch (*Betula papyrifera*) is by far the most abundant tree, and next in rank are the poplars, of which there are two species, *Populus balsamifera* and *Populus tremuloides*. Alders and willows are found along the streams and

sparingly through the forest. The underbrush is not heavy; it consists mainly of *Menziesia* and *Viburnum*, with an occasional clump of devil's club (*Echinopanax*) in wet places. Long grass grows luxuriantly in numerous pretty open glades in the birch woods. The September aspect of the forest is very attractive. From a little distance the birches on the low, rolling slopes appear as a mass of golden and rusty yellow, punctured here and there by the dark-green spruce tops. The foliage of many of the smaller plants, such as *Viburnum*, *Cornus*, *Ribes*, and *Epilobium*, is bright red, and adds greatly to the general effect. On the whole, it reminds one very much of the autumn woods of New England, and is quite unlike anything I have seen elsewhere in Alaska.

Unfortunately, we made no collection of plants in the Cook Inlet region, hence an authoritative list can not be given here. The following list, with brief annotations copied from my field notes, gives a general idea of the important trees and woody plants that occur. Specimens of a few species were preserved, and these have been identified by Mr. Frederick V. Coville; the remainder are field identifications only.

***Tsuga mertensiana*.** Alpine Hemlock.

This is the most abundant tree from the seacoast to timberline all about Turnagain Arm. It was not found elsewhere in the Cook Inlet region.

***Picea sitchensis*.** Sitka Spruce.

A few trees of this species were found at Hope. Specimens preserved.

***Picea canadensis*.** White Spruce.

Found at all points visited, including Homer, Hope, and Tyonek. It is very common about Turnagain Arm, and is found on the mountains up to an altitude of about 2,000 feet. It is practically the only conifer to be found at Tyonek. Specimens preserved.

***Picea mariana*.** Black Spruce.

Found in limited numbers in peat bogs at Hope, Sunrise, and Tyonek. Specimens preserved.

***Empetrum nigrum*.** Black Crowberry.

This is by far the most common heather-like shrub. It abounds in all the peat bogs in the low country, and there are miles and miles on the mountains where one could not walk without treading on it.

***Populus balsamifera*.** Balsam Poplar.

Very abundant. Large groves stand on the flat near the mouth of Resurrection Creek and trees of smaller stature are numerous in all the Turnagain Arm country; also abundant at Tyonek.

Populus tremuloides. Aspen.

A few trees supposed to be this species were found with the balsam poplars at Tyonek. Not seen elsewhere.

***Salix* sp.** Willow.

Four or more species of willows occur in the Cook Inlet region, including several dwarf species only found above or near timberline.

Alnus sinuata. Alder.

Abundant all about the inlet. In the low country it is found along streams, and on the mountains it forms into dense thickets extending in altitude far above the coniferous trees.

Betula papyrifera. Paper Birch.

Abundant all about the inlet. Its vertical range is about coextensive with that of the conifers. At Tyonek it surpasses all other trees in point of numbers and grows to a slightly larger size than at Hope. Judging from the size of some of the Indian birch baskets trees a foot or more in diameter are to be found.

Betula glandulosa. Dwarf Birch.

Common. In the low country it is most common in peat bogs; high on the mountains it is found on open slopes in company with the dwarf willows.

Ledum grœnlandicum. Labrador Tea.

Rather common, but more or less confined to peat bogs and wet heather meadows. Specimen preserved.

Ledum palustre. Dwarf Labrador Tea.

Less common than the preceding species, with which it is found.

Menziesia ferruginea. Menziesia.

A large percentage of the underbrush is composed of this species. It was found at all points visited, but most commonly at Tyonek.

Phyllocladus glanduliflora. Heather.

Found in limited quantities above 2,000 feet altitude in the higher mountains near Hope. Specimen preserved.

Cassiope tetragona. Cassiope.

Rather rare. It was occasionally found in the beds of *Empetrum* in the high mountains near Hope. Specimen preserved.

Cassiope stelleriana. Cassiope.

Quite common above timberline in the mountains near Hope. Specimen preserved.

Arctostaphylos uva-ursi. Bearberry.

A few plants were found on a rocky point near Hope. It was not observed elsewhere about the inlet.

Vaccinium vitisidæa. Mountain Cranberry.

Very abundant from the coast to the upper limit of plant growth.

Vaccinium sp. Huckleberry.

Several species are abundant.

Sorbus sambucifolia. Mountain Ash.

Common, both in the mountains near Hope and in the low hills at Tyonek.

Viburnum pauciflorum. Highbush Cranberry.

Very common at all points visited.

Sambucus racemosus. Elderberry.

Abundant in the mountains near Hope; occasionally seen near Tyonek.

Cornus canadensis. Bunchberry.

Excessively abundant.

Echinopanax horridum. Devil's Club.

A few clumps of under-sized devil's club were occasionally found in damp shady places about Cook Inlet.

Ribes laxiflorum. Blue Currant.

Occurs sparingly in Turnagain Arm.

Ribes rubrum. Red Currant.

Quite common in Turnagain Arm.

Rosa acicularis. Wild Rose.

Abundant all about the inlet; especially so at Tyonek.

Amelanchier alnifolia. Serviceberry.

A single bush was found at Tyonek. The species was not seen elsewhere about the inlet.

Rubus strigosus. Raspberry.

Abundant at Hope and Tyonek.

Spiræa betulæfolia? Spiræa.

Abundant.

FAUNA.

The mammals of the Cook Inlet region are essentially the same as those of the interior of Alaska. Nearly all the species of the lower

Yukon Valley are found among them, and none show any marked peculiarities not possessed in their interior habitat. With the exception of widely distributed species, such as the black bear, no species are common to the Cook Inlet region and the Sitkan region. Thus, while the mammals of Cook Inlet are not peculiar to the region, the mammal fauna, as a whole, is peculiar, as contrasted with that of the coast farther south. Two new species, *Microtus miurus* and *Sorex eximius*, were found, but both are new, not only to Cook Inlet, but to Alaska as well, and will undoubtedly be found in other parts of the Territory. Considering the latitude, both large and small mammals are numerous in species as well as individuals. Moose, bear, and mountain sheep are the principal big game, and although they have already been hunted to a considerable extent, it is probable that they are more abundant than in any equally accessible place in North America. Fur-bearing animals are well represented, but, as elsewhere in the North, have been much reduced in numbers. The smaller, less conspicuous mammals are such as are generally found throughout northern Alaska, and are well represented on account of the varied conditions offered by the mountains of the Kenai Peninsula and the low country on the northwest side of the inlet. Our collection of mammals from Cook Inlet numbers 240 specimens, the majority of which, of course, are species of small size, such as shrews and mice, since we made no special effort to secure big game.

Birds were not found in great numbers. Owing to the lateness of the season at the time of our arrival in the inlet, those seen were permanent residents or fall stragglers, the summer residents being missed almost entirely. Land birds, with the exception of grouse, which were fairly common, were not numerous in species or individuals. Water birds, particularly littoral or semi-pelagic forms, are noticeably uncommon, probably on account of the brackish water of the inlet and the comparative absence of marine invertebrates. Ducks and geese, however, and birds which feed in fresh water are locally quite abundant. As in the case of the mammals, no birds are peculiar to the Cook Inlet region, but several interior species are found which do not occur on the Alaskan coast south of Cook Inlet.

The only other land vertebrate is a frog, collected by Heller at Tyonek. The species has very kindly been determined by Dr. L. Stejneger as *Rana cantabrigensis latiremis*. The land vertebrates may be summed up as follows:

MAMMALS.

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|---------------------------------------|---|
| 1. <i>Rangifer stonei</i> . | 8. <i>Arctomys caligatus</i> . |
| 2. <i>Alces gigas</i> . | 9. <i>Castor canadensis</i> . |
| 3. <i>Ovis dalli</i> . | 10. <i>Evotomys dawsoni</i> . |
| 4. <i>Oreamnos kennedyi</i> . | 11. <i>Microtus operarius kadiacensis</i> . |
| 5. <i>Sciuropterus</i> sp. | 12. <i>Microtus miurus</i> . |
| 6. <i>Sciurus hudsonicus</i> . | 13. <i>Fiber spatulatus</i> . |
| 7. <i>Spermophilus empetra</i> subsp. | 14. <i>Synaptomys dalli</i> . |

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|--|----------------------------------|
| 15. <i>Zapus hudsonius alascensis.</i> | 25. <i>Lutreola vison.</i> |
| 16. <i>Erithizon epixanthus myops.</i> | 26. <i>Putorius kadiacensis.</i> |
| 17. <i>Ochotona collaris.</i> | 27. <i>Putorius rixosus.</i> |
| 18. <i>Lepus americanus dalli.</i> | 28. <i>Mustela americana.</i> |
| 19. <i>Lynx canadensis.</i> | 29. <i>Gulo luscus.</i> |
| 20. <i>Canis occidentalis.</i> | 30. <i>Sorex personatus.</i> |
| 21. <i>Vulpes kenaiensis.</i> | 31. <i>Sorex alascensis.</i> |
| 22. <i>Ursus americanus.</i> | 32. <i>Sorex eximius.</i> |
| 23. <i>Ursus middendorffi.</i> | 33. <i>Myotis lucifugus.</i> |
| 24. <i>Lutra canadensis.</i> | |

BIRDS.

- | | |
|--|--|
| 1. <i>Gavia imber.</i> | 40. <i>Nyctea nyctea.</i> |
| 2. <i>Gavia lumme.</i> | 41. <i>Ceryle alcyon.</i> |
| 3. <i>Uria troile californica.</i> | 42. <i>Picoides americanus fasciatus.</i> |
| 4. <i>Stercorarius parasiticus.</i> | 43. <i>Selasphorus rufus.</i> |
| 5. <i>Rissa tridactyla pollicaris.</i> | 44. <i>Contopus borealis.</i> |
| 6. <i>Larus sp.</i> | 45. <i>Pica pica hudsonica.</i> |
| 7. <i>Larus philadelphia.</i> | 46. <i>Cyanocitta stelleri.</i> |
| 8. <i>Sterna paradisea.</i> | 47. <i>Perisoreus canadensis fumifrons.</i> |
| 9. <i>Diomedea albatrus.</i> | 48. <i>Corvus corax principalis.</i> |
| 10. <i>Phalacrocorax pelagicus.</i> | 49. <i>Scolecophagus carolinus.</i> |
| 11. <i>Anas boschas.</i> | 50. <i>Loxia curvirostra minor.</i> |
| 12. <i>Dafila acuta.</i> | 51. <i>Loxia leucoptera.</i> |
| 13. <i>Aythya marila nearctica.</i> | 52. <i>Acanthis linaria.</i> |
| 14. <i>Somateria v-nigra.</i> | 53. <i>Spinus pinus.</i> |
| 15. <i>Oidemia perspicillata.</i> | 54. <i>Calcarius lapponicus alascensis.</i> |
| 16. <i>Branta canadensis subsp.</i> | 55. <i>Ammodramus sandwichensis alaudinus.</i> |
| 17. <i>Olor columbianus.</i> | 56. <i>Zonotrichia leucophrys gambeli.</i> |
| 18. <i>Ardea herodias.</i> | 57. <i>Zonotrichia coronata.</i> |
| 19. <i>Grus canadensis.</i> | 58. <i>Spizella monticola ochracea.</i> |
| 20. <i>Phalaropus lobatus.</i> | 59. <i>Junco hyemalis.</i> |
| 21. <i>Gallinago delicata.</i> | 60. <i>Melospiza melodia kenaiensis.</i> |
| 22. <i>Macrorhamphus griseus scolopaceus.</i> | 61. <i>Melospiza lincolni.</i> |
| 23. <i>Tringa couesi.</i> | 62. <i>Passerella iliaca annectens.</i> |
| 24. <i>Tringa bairdi.</i> | 63. <i>Lanius borealis.</i> |
| 25. <i>Tringa alpina pacifica.</i> | 64. <i>Helminthophila celata lutescens.</i> |
| 26. <i>Ereunetes occidentalis.</i> | 65. <i>Dendroica coronata.</i> |
| 27. <i>Limosa hæmastica.</i> | 66. <i>Dendroica striata.</i> |
| 28. <i>Totanus melanoleucus.</i> | 67. <i>Anthus pensilvanicus.</i> |
| 29. <i>Actitis macularia.</i> | 68. <i>Cinclus mexicanus.</i> |
| 30. <i>Numenius hudsonicus.</i> | 69. <i>Certhia familiaris montana.</i> |
| 31. <i>Squatarola squatarola.</i> | 70. <i>Parus atricapillus septentrionalis.</i> |
| 32. <i>Canachites canadensis osgoodi.</i> | 71. <i>Parus hudsonicus.</i> |
| 33. <i>Lagopus rupestris.</i> | 72. <i>Regulus satrapa olivaceus.</i> |
| 34. <i>Lagopus leucurus.</i> | 73. <i>Regulus calendula.</i> |
| 35. <i>Circus hudsonicus.</i> | 74. <i>Hylocichla ustulata almæ.</i> |
| 36. <i>Accipiter atricapillus striatulus.</i> | 75. <i>Hylocichla aonalaschkæ.</i> |
| 37. <i>Haliaeetus leucocephalus alascanus.</i> | 76. <i>Merula migratoria.</i> |
| 38. <i>Falco columbarius.</i> | 77. <i>Hesperocichla nævia.</i> |
| 39. <i>Bubo virginianus saturatus.</i> | |

BATRACHIAN.

Rana cantabrigensis latiremis.

LIFE ZONES.

Two zones are evident in the Cook Inlet region, the Hudsonian and the Arctic-Alpine. All the low country about the inlet and also the mountain sides up to timberline may be considered as Hudsonian, and the region above timberline on the mountains as Arctic-Alpine. The Hudsonian region has the same general features as the great interior transcontinental Hudsonian belt, and is doubtless imperfectly connected with it. This Hudsonian belt is not particularly marked by characteristic forms, since most of the species of plants and the genera of mammals and birds are also found in the Canadian zone; but its distinction consists in the absence of many of the forms which are characteristic of the Canadian zone or which range from the south up into that zone. A notable feature of the Hudsonian flora of Cook Inlet, which is to some extent an exception to the statement just made, is the abundance of *Tsuga mertensiana* at sea level on the shores of Turnagain Arm. This tree is exceedingly characteristic of the Hudsonian zone, and except at this point has been found only high on mountains in the vicinity of timberline, as its name, the alpine hemlock, implies. The other large trees of Cook Inlet, *Picea canadensis*, *Picea sitchensis*, *Picea mariana*, *Populus balsamifera*, *Populus tremuloides*, *Alnus sinuata*, and *Betula papyrifera*, are such as are generally found in a northern Hudsonian zone, but all are also found in the Canadian. Such trees as *Pinus*, *Abies*, *Thuja*, etc., which are represented in the Canadian zone of the Sitkan district, are entirely absent in Cook Inlet. The mammals and birds of the Hudsonian district of Cook Inlet are, like the trees, nearly all species which are found in the Hudsonian of the interior of Alaska, but which also range, at least to some extent, into the Canadian. All the genera of mammals belong to this category, as well as many species, such as *Sciurus hudsonicus*, *Eutamias darwoni*, *Fiber spatulatus*, *Synaptomys dalli*, *Erethizon epixanthus myops*, *Putorius rixosus*, and *Sorex personatus*.

The Arctic-Alpine district includes the summits of nearly all the mountains on both sides of Turnagain Arm (see Pl. VII), and in the interior of the Kenai Peninsula. Spruce and hemlock timber ceases between 2,000 and 3,000 feet elevation, and the higher slopes are clothed only with matted masses of low shrubs or wide expanses of tall grass. In the gulches thickets of alders hold control and a few stunted individuals often straggle well up toward the snow line. The characteristic mammals of this Arctic-Alpine district are the Dall mountain sheep (*Ovis dalli*), the hoary marmot (*Arctomys caligatus*), and the Alaska mountain vole (*Microtus miurus*). The only characteristic birds found at the time of our work were the ptarmigans (*Lagopus rupestris* and *L. leucurus*), but pipits (*Anthus*), golden-

crowned sparrows (*Zonotrichia*), and rosy finches (*Leucosticte*) doubtless occur in the breeding season.

Taken as a whole, the plant and animal life of Cook Inlet is very closely similar to that of the Yukon Valley, or, in more general terms, to that of the interior of Alaska. This condition is the more noteworthy, since the fauna and flora of the same coast south of Cook Inlet are in marked contrast to those of the interior in the same latitude. Since coast influences are usually conducive to life that is relatively more boreal than that of the interior, large faunal regions of the interior seldom extend to the actual coast, except with considerable modification. This is true in most cases even when no immense masses of mountains separate coast and interior as they do in the Pacific region from southern British Columbia northwestward. The contrast, however, would be less if no mountains intervened, or if low passes permitted communication; moreover, the climatic conditions of coast and interior would approximate each other more closely in a northern latitude than in a southern. It seems probable, therefore, that this contrast in plant and animal life is minimized in the Cook Inlet region both on account of the northern latitude and the existence of some degree of connection with the interior.

PREVIOUS WORK.

Very little natural history work has been done in the Cook Inlet region. In 1869, Ferdinand Bischoff made a small collection of birds and mammals at Fort Kenai which was sent to the U. S. National Museum; but though casual references to individual specimens have occasionally appeared, no account of the collection, as a whole, has been published. The entire collection is recorded in the catalogues of the Museum, but many of the specimens have been exchanged or distributed to educational institutions; enough still remain, however, to be of considerable value in making a faunal list. A few species of birds from Cook Inlet have been recorded by Dr. Tarleton H. Bean,¹ who made brief stops about the mouth of the inlet while connected with an expedition of the U. S. Coast and Geodetic Survey, and the specimens collected are deposited in the U. S. National Museum. A few specimens were also taken near the mouth of the inlet by Messrs. C. H. Townsend and B. W. Evermann during a brief stop of the U. S. Fish Commission steamer *Albatross*. Numerous sportsmen have, in recent years, been attracted by the large game in the vicinity of the inlet and in some cases have published accounts² of their trips containing many valuable notes on the natural history and general features of the region. The most prominent of these are Messrs. Dall De Weese and Andrew

¹ Proc. U. S. Nat. Museum, V, 144-173, 1882.

² Many narratives of hunting trips in Alaska, particularly about Cook Inlet, may be found in Recreation, Forest and Stream, and American Field.

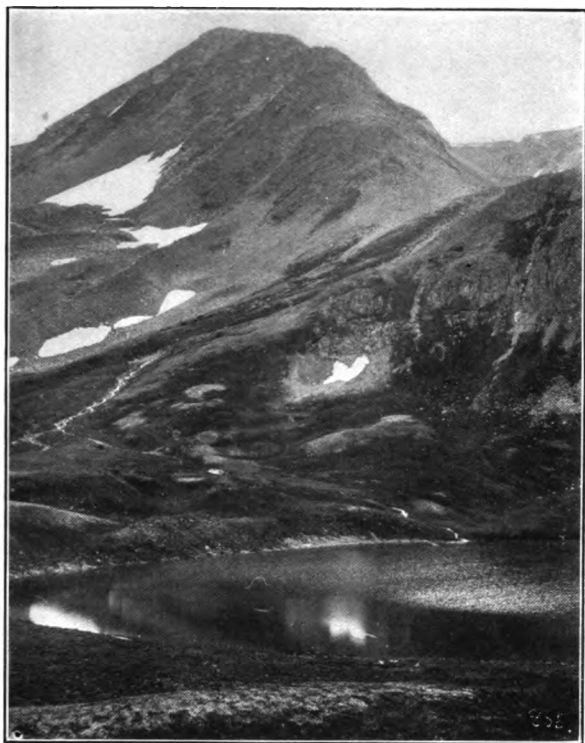


FIG. 1.—PEAK AT HEAD OF BEAR CREEK.
Habitat of *Arctomys caligatus* and *Microtus miurus*.

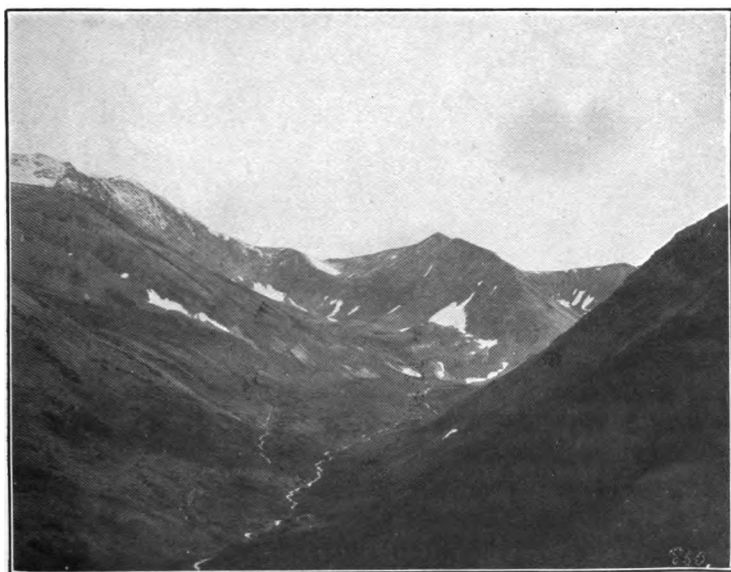


FIG. 2.—CANYON OF UPPER BEAR CREEK.

J. Stone. Mr. De Weese collected and preserved an excellent series of moose¹ and Dall sheep for the U. S. National Museum, and Mr. Stone secured many fine specimens, including the type of *Rangifer stonei*,² for the American Museum of Natural History, New York.

The topography and geology of the region have been studied by parties from the U. S. Geological Survey and in their reports may be found a few notes regarding animals and plants as well as much other matter of general interest.³

The report of the War Department on the 'Sushitna Expedition,' under Capt. E. F. Glenn, also contains numerous general notes of value.⁴

MAMMALS OF THE COOK INLET REGION.

Alces gigas Miller. Alaska Moose.

According to report the moose has but recently appeared in the Cook Inlet region; the older Indians say no moose were there when they were boys; and even within the memory of white men it has moved westward, now being known as far out on the Alaska Peninsula as Katmai.

It is quite common in many places about Cook Inlet, but is hunted most successfully in the Knik district, and on the north shore of the Kenai Peninsula, from Kussilof and Fort Kenai to Point Possession at the mouth of Turnagain Arm. A few Indians hunt moose here practically all the year round, making a living by selling the meat in the mining camps of Hope and Sunrise. Several carcasses were brought in during our stay and the meat was quickly sold at 10 cents a pound. On the northwest side of the inlet moose are less common than on the Kenai Peninsula, but occur sparingly.

Rangifer stonei Allen. Stone's Caribou.

Rangifer stonei Allen, Bul. Am. Mus. Nat. Hist. New York, XIV, 143-148, May 28, 1901.

Caribou are rare on the Kenai Peninsula. I saw a pair of weather-beaten antlers said to have been picked up on the peninsula side near the mouth of Turnagain Arm and heard an unsatisfactory report of the killing of a large buck, but beyond this could obtain no evidence of the animal's occurrence in this region near the coast. Mr. Stone, who secured the type of the species, also received reliable reports of

¹ See Miller, Proc. Biol. Soc. Wash., XIII, 57-59, May 29, 1899.

² See Allen, Bul. Am. Mus. Nat. Hist., XIV, 143-148, 1901.

³ See Dall, Report on Coal and Lignite. <17th Ann. Rept. U. S. Geol. Survey, Pt. I, pp. 771-908, 1896; Neocene of North Am., <Bul. No. 84, U. S. Geol. Survey, pp. 234-238, 1892; Eldridge, Reconnaissance Sushitna Basin, etc., <20 Ann. Rept. U. S. Geol. Survey, Pt. VIII, pp. 6-29, 1900; Mendenhall, Reconnaissance Resurrection Bay to Tanana River, Ibid, pp. 271-340.

⁴ Reports of explorations in the Territory of Alaska, Adj. Gen. Office, Doc. No. 102, pp. 5-289, 1899.

the occurrence of caribou in the southern and western part of the Kenai Peninsula, but stated that they are "already very scarce and will doubtless soon be exterminated." (See Allen, loc. cit.) Two specimens, male and female, shot by Mr. Harry E. Lee on the Kenai Peninsula, have been recorded by Mr. D. G. Elliot.¹ They are more or less common a short distance in the interior and are often killed near the Sushitna River, whence their skins are brought to the coast to be traded.

The characters which distinguish Stone's caribou from the mountain caribou (*Rangifer montanus*) seem to be slight, and the claim of *stonei* to full specific rank has been questioned. The statement in this connection that "it is very evident that our knowledge of western and northwestern caribou is very imperfect and unsatisfactory, our material having been altogether insufficient" is not only true, but should be very significant; for if more specimens of this rare animal are not obtained for our museums in the near future, the question of its specific distinctness may never be decided beyond question.

Oreamnos kennedyi Elliot. Alaska Mountain Goat.

Oreamnos kennedyi Elliot. Field Columbian Mus., Chicago. Pub. 46, Zool. Series III, 3-5, June, 1900.

I could obtain no evidence of the occurrence of goats on any part of the Kenai Peninsula, but I learned from T. W. Hanmore, who has been the Alaska Commercial Company's agent at Tyonek for the past eleven years, that a small band is known to inhabit a district between the headwaters of the Knik and Matanuska rivers. Mr. Hanmore knows the animals thoroughly and says he has seen skins and horns from this place and often heard of them from the Indians who hunt in that vicinity. As far as I can learn, this is the northernmost occurrence of the mountain goat.

Ovis dalli (Nelson). Dall Sheep.

Dall sheep were formerly common in the mountains on both sides of Turnagain Arm, but since active mining began there they have retreated to the interior of the peninsula, where they still occur in large numbers. They are also common in the mountains near the Knik River, from which place several heads were brought in by Indians while we were at Sunrise City. According to apparently reliable report, these sheep in the interior of the Kenai Peninsula gather into very large flocks in fall, as many as three hundred individuals having been seen together at one time. There are several routes into the sheep country, the easiest and the one most frequently used being that via the Kussilof River to Kussilof Lake and thence into the mountains.

¹ Field Columbian Mus. Zool. Ser., III, 59-62, Pls. XI-XIII, July, 1901.

Sciuropterus sp.

Flying squirrels are said to have been taken in the Knik district, but are unknown elsewhere about Cook Inlet. The numerous miners and woodsmen about Turnagain Arm were unable to give us any information as to the occurrence of flying squirrels, except in the Knik district.

Sciurus hudsonicus Erxleben. Hudson Bay Red Squirrel.

Common at all points visited. A few were seen at Homer, larger numbers at Tyonek, and in the low country about Hope they were excessively abundant. Sixteen specimens were taken, fourteen at Hope and two at Tyonek. These are indistinguishable from specimens in the same pelage taken near the west coast of Hudson Bay, as well as from those taken in the interior of Alaska, and show but very slight tendency toward *Sciurus h. petulans*; hence they are referred without hesitation to *Sciurus hudsonicus*.

Spermophilus empetra subsp.? Ground Squirrel.

Spermophiles do not occur near Turnagain Arm or at Tyonek. They are said to be abundant on the Barren Islands near the mouth of the inlet and are evidently so in the mountains lying some 60 miles back of Tyonek. While we were at Tyonek an Indian brought in a lot of one hundred spermophile skins from these mountains to be used in making parkas and other articles of native wearing apparel.

Arctomys caligatus Eschscholtz. Hoary Marmot.

Abundant in the mountains about Turnagain Arm, where they are known to the miners as 'whistling pigs.' In the mountains at the head of Bear Creek we found them living in grassy meadows above timberline and on open hillsides rather than in rocky places. Their burrows in these places differ from those of spermophiles only in size. Wide well-beaten paths through the grass connect different burrows and diverge from them here and there over the slopes in the same manner as those of spermophiles. The vicinity of the burrow is usually very filthy with excreta.

Although the hoary marmots of these mountains seldom see a human being even at a distance, they are exceedingly shy and disappear at the slightest alarm, on which account it was very difficult to get even within rifle range of them.

Castor canadensis Kuhl. American Beaver.

According to report which I received from a trapper at Hope, three beaver were secured by Indians near the mouth of Turnagain Arm in the fall of 1899. A limited number are secured every season along streams in the mountains about 60 miles inland from Tyonek. A trading station on the lower Sushitna River also obtains a small quota

annually. Compared with former receipts, however, the number now obtained is lamentably small.

Mus norvegicus Erxleben. Norway Rat.

A few rats have established themselves about the wharf and stores at Sunrise. They have also occasionally escaped from vessels at Hope and Tyonek, but have not increased in numbers.

Eutamias dawsoni Merriam. Dawson Red-backed Mouse.

Abundant in mossy places and about decayed logs in the woods; only rarely taken in *Microtus* runways on the tide flats; quite numerous about the houses and stores in the villages and in the miners' cabins in the backwoods. Thirty-eight specimens were secured as follows: Hope, 21; mountains at the head of Bear Creek, near Hope, 4; Tyonek, 13. These seem to be intermediate in character between *Eutamias dawsoni* and *Eutamias dawsoni orca*,¹ including specimens which might be referred to each form. As the majority, however, are more similar to *dawsoni*, they are recorded under that name.

Microtus operarius kadiacensis (Merriam). Kadiak Vole.

Microtus kadiacensis Merriam, Proc. Biol. Soc. Wash., XI, 222, July 15, 1897; Bailey, North Am. Fauna, No. 17, 41-42, June 6, 1900.

This vole is rather rare at Hope, but very abundant at Tyonek. It is common at Homer also, as numerous signs of it were seen on the grass-grown sandspit near there. The runways are very large and were usually found in coarse grass (*Elymus mollis*) on low, sandy stretches near tide level. Great quantities of grass cuttings were always found in the runways. In one place near Tyonek these mice had invaded a potato patch and made well-beaten paths in and out under the vines, but the amount of damage they inflicted on the crop was apparently slight.

Thirty-one specimens were taken at Tyonek and five at Hope. These agree very closely with topotypes of *M. kadiacensis*, but in some respects tend toward *M. operarius*. The molar teeth and the audital bullæ are very slightly smaller than in *kadiacensis*, yet not quite so small as in *operarius*. In size the Cook Inlet specimens are about equal to those from Kadiak and somewhat larger than topotypes of *operarius*.

Microtus miurus² sp. nov. Alaska Mountain Vole.

Type from head of Bear Creek in mountains near Hope City, Turnagain Arm, Cook Inlet, Alaska. ♂ ad. No. 107175, U. S. Nat. Mus., Biological Survey collection. Collected Sept. 4, 1900, by W. H. Osgood and E. Heller. Original No. 1349.

Characters.—Size small, tail short, color buffy, underparts suffused with body color, molar enamel pattern as in *Microtus abbreviatus*; skull distinctive.

¹ *Eutamias orca* Merriam, Proc. Wash. Acad. Sci., II, 24-25, Mar. 14, 1900.

² *Miurus*=curtailed.

Color.—*Fresh fall pelage* (No. 107167): Upperparts uniform pale tawny, lightly mixed with black; face, sides, and flanks exactly like back; underparts strongly washed with buffy; tail dusky above, buffy below and on sides. *Worn summer pelage* (Type, No. 107175): Upperparts pale buffy gray with plumbeous under-fur showing through in places; underparts whitish gray faintly suffused with buffy. *Young*: Similar to adults but grayer, with buff somewhat intensified about the ears and base of tail.

Skull.—Size small; dorsal outline nearly straight, very slightly depressed in interorbital region; nasals of moderate length, somewhat expanded anteriorly; naso-frontal suture slightly emarginate; lachrymal shelf prominent, with decided dorsal depressions between fronto-maxillary sutures; zygomata rounded anteriorly with scarcely any prezygomatic notch; interparietal slightly produced anteriorly, about twice as wide as long; audital bullæ full and rounded, their inner surfaces nearly parallel; lateral pits of palate shallow, interpterygoid fossa rather wide. Teeth rather light; upper incisors slightly sulcate; molar enamel pattern essentially as in *Microtus abbreviatus*; \overline{m}^3 with but 2 closed triangles; \overline{m}^1 with 5 closed triangles and 5 inner and 4 outer salient angles.

Measurements.—Type: ♂ ad. Total length 153; tail vertebrae 31; hind foot 20. Average of three females: 133; 23; 19. Skull: Basal length 26; zygomatic breadth 15; mastoid breadth 11.4; nasals 7; alveolar length of upper molar series 6.2.

Remarks.—In a general way *Microtus miurus* is a miniature of *M. abbreviatus*, which is undoubtedly its nearest known relative, but detailed differences are very numerous. External characters other than size are its relatively longer tail and its more ochraceous color; cranial characters most appreciable are its full, rounded, and nearly parallel audital bullæ and the nearly straight dorsal outline of the skull. The peculiar enamel pattern like that of *M. abbreviatus* is sufficient to distinguish *miurus* from all other members of the subgenus *Microtus*. The discovery of a mainland relative of the insular species *abbreviatus* is very interesting and indicates in a slight way how much is still to be learned of the small mammals of Alaska. In the high mountains of the interior other similar forms undoubtedly remain to be discovered. Eleven specimens were secured, including five adults and six young. These were all taken in 'meadows' above timberline in the mountains near Hope on the south side of Turnagain Arm. In these places it was only by very careful and diligent trapping that they were secured, for though many runways were found but very few showed signs of recent use. The burrows instead of opening vertically in the side of a slight eminence, as usual, have entrances which are flush with the floor of the runway. The grass in which these runs are made is very short, as it grows in rocky soil near

the upper limit of vegetation in small hollows and basins. Snow lies in these places all the time except a few months in summer.

Fiber spatulatus Osgood. Northwest Muskrat.

Fiber spatulatus Osgood, N. Am. Fauna No. 19, pp. 36-37, Oct. 6, 1900.

Musk rats are not known to occur about Turnagain Arm, but they are rather common about small ponds in the peat bogs near Tyonek. They also occur at Kenai, as is shown by two specimens from there collected by Bischoff in 1869 and now in the National Museum. These, as well as one that we secured at Tyonek, are typical *Fiber spatulatus*, having the small molars and expanded nasals exactly as in the type of the species.

Synaptomys dalli Merriam. Dall Lemming Mouse.

One adult male was taken in a small peat bog near Hope August 26, but persistent trapping in the same locality failed to secure more, and none were found elsewhere about the inlet. The single specimen secured is essentially the same as an adult male from Lake Lebarge, Yukon Territory. The Cook Inlet specimen is slightly lighter, particularly on the head and shoulders, where there is less admixture of black. The skull agrees perfectly with the Yukon specimen and both agree fairly well with the type of *dalli*, all having much larger audital bullæ than the coast form *wrangeli*. The flesh measurements of the Cook Inlet specimen are as follows: Total length 131; tail vertebrae 22; hind foot 20. Skull: Basal length 25; mastoid breadth 14.8; zygomatic breadth 15.6; nasals 7.5; alveolar length of upper molar series 7.9.

Zapus hudsonius alascensis Merriam. Alaska Jumping Mouse.

A jumping mouse in good condition was found floating in a sunken water barrel near Tyonek September 13. The entire vicinity was assiduously trapped, but no more could be obtained, from which it seems that the species is rare, though possibly it may have gone into early hibernation. It also occurs in Turnagain Arm, for a miner at Hope accurately described one to me that he had seen there several years ago.

Erethizon epixanthus myops Merriam. Alaska Porcupine.

Porcupines are abundant in the Turnagain Arm region, but are very rare at Tyonek. Mr. T. W. Hanmore, who has lived at Tyonek for eleven years, says that he has seen but one porcupine there in that time. The natives on the Kenai Peninsula use porcupine flesh as food and prize it very highly. They prepare the animals by first plucking out all the quills, then singeing off the hair, then roasting entire. I did not have an opportunity to taste the flesh cooked in this way, but found it very palatable when fried. Porcupines are eaten by various

carnivorous animals, particularly wolves, though doubtless only in extreme hunger. Old trappers and hunters say that the majority of the wolves taken in this region have porcupine quills in their stomachs and under the skin about their heads.

Ochotona collaris (Nelson). Alaska Pika.

Pikas do not occur in the mountains on the peninsula side of Turnagain Arm, but I was told by a miner from Knik River that they had been seen in the mountains near there.

Lepus americanus dalli Merriam. Dall Varying Hare.

A few signs of rabbits were seen at Hope, but no specimens were secured; they are said to be very abundant in winter. Six specimens were obtained at Tyonek, but only by persistent and careful trapping. All were caught in steel traps set in runways in the thickets or in the peat bogs. Rabbits are very seldom seen here in the daytime, and dependence on gun alone would result in but a small bag. Although the summer pelage of *dalli* is unknown and there is some possibility that topotypes would be slightly different in color from the Cook Inlet specimens, I have little hesitancy in referring the latter to *dalli*, since the skulls are nearly typical, being but slightly smaller and shorter. Most of the specimens from Tyonek are slightly immature and the color of the upperparts is strongly mixed with black. In one of the oldest (No. 107611) the predominating color of the upperparts is cinnamon; the middle of the back is heavily mixed with black, which becomes less intense laterally until at the edge of the pure white underparts there is no trace of it, and a clear cinnamon lateral line remains. The throat is also cinnamon with very faint signs of black. The outer sides of the fore legs and fore feet are russet and dusky and the inner sides are creamy white. The hind feet are white well mixed with cinnamon and dusky. The ears are nearly white, except in front, where there is a strong cinnamon and dusky admixture. The flesh measurements of the six specimens average as follows: Total length 441; tail vertebræ 39; hind foot 139.

Lynx canadensis (Kerr). Canada Lynx.

Lynxes are evidently still fairly common. Mr. George Coon, a reliable woodsman of Hope, told me that in a season of two and one-half months' trapping in the winter of 1899 he secured fifteen lynxes near the mouth of Turnagain Arm.

Canis occidentalis Richardson. Wolf.

Wolves are considered rather common in the Cook Inlet region. Mr. Coon, of Hope, told me that during the winter of 1899 he secured fourteen with poison. Among these were six in the black phase.

Vulpes kenaiensis Merriam. Kenai Fox.

Vulpes kenaiensis Merriam, Proc. Wash. Acad. Sci., II, 670, Dec. 28, 1900.

Red, cross, and black foxes are taken annually in limited numbers. This species, which, as far as known, is the only one found in the region, is the largest fox known to North America. The skins secured here are usually of very good quality and blacks or 'silver grays' commanding high prices are not uncommon. Some attempt at 'farming' these large foxes has been made, but so far has generally proved unsuccessful on account of the vicious habit the males have of injuring or devouring the young. It seems possible, however, that while this might interfere with such extensive breeding farms as are feasible in the case of the blue fox, it might be controlled and the business made profitable if a few pairs were kept at each of a large number of localities.

Ursus americanus Pallas. Black Bear.

Black bears are moderately common in the Cook Inlet region. A few are killed about Turnagain Arm each year, but they are less common in the lower country on the northwest side of the inlet. While returning from our traps on upper Bear Creek on the evening of September 1, we discovered a bear crossing a grassy place between two alder thickets on a hillside near us. I hurried to camp and returned with my rifle and after a long stalk succeeded in securing it. It proved to be a young female. The fur was short, but even and glossy black. The animal had been feeding on berries entirely and its stomach was found filled to distension, chiefly with black crowberries (*Empetrum nigrum*). These were clean and absolutely free from twigs and leaves and so tightly packed that there hardly seemed room for another mouthful. The feeling of satisfaction enjoyed by the possessor of this well-filled paunch was very evident. Before shooting it I had an opportunity to watch it feeding and was amused at its exhibition of exuberant spirits. It would browse leisurely for a few minutes then would suddenly give a bound and roll over and over down a little heather-grown glade to the bottom and then jump up to gallop at full speed up and down and around in a circle, apparently impelled by nothing but sheer joy. This bear measured in the flesh as follows: Total length 1,310; tail vertebræ 166; hind foot 213.

Ursus middendorffi Merriam. Kadiak Bear.

Large bears are still very often seen both on the Alaska Peninsula side of Cook Inlet and on the mountainous Kenai Peninsula. According to report they were very abundant about ten years ago, but in the short time since have been so constantly pursued that their numbers have been greatly reduced. Nearly every old prospector has one or more stories to tell about personal experiences with big brown bears, and often is able to show the skins as evidence of his truthfulness.

Both whites and natives distinguish several varieties of large bears according to color. One of these, which is called the 'big white bear,' and of which I examined specimens, is creamy white about the neck, shoulders, and back, and pale brownish about the haunches and legs. Nearly every degree of gradation from these 'white' bears to the dark brown ones may be found, however, so that it does not seem probable that more than one species is represented.

Mr. T. W. Hanmore, of Tyonek, says the brown bear generally goes into hibernation early in October, but that a few years ago he saw the track of one that had plowed through 2 feet of snow down to the beach near Tyonek in the middle of November.

***Latax lutris* (Linnaeus).** Sea Otter.

Sea otters are said to have been seen in Cook Inlet, but owing to the very muddy water it is probable that they were never numerous there, even in times of their greatest abundance elsewhere.

***Lutra canadensis* (Schreber).** Land Otter.

Apparently rather uncommon, though a few are said to be taken every winter.

***Lutreola vison energumenos* Bangs.** Pacific Mink.

Moderately common. A few mink tracks were seen along some of the small streams. Several skins of poor quality were offered for sale by miners at Hope. One specimen, a male in good pelage, was taken on a small stream near Tyonek September 16. It is not fully adult, and its skull shows no characters of value; but its color is very dark. On this account it is referred to *energumenos*.

***Putorius kadiacensis* Merriam.** Kadiak Weasel.

One specimen was secured at Hope August 30. It was shot while in the act of making away with some scraps of meat that had been thrown out near the door of our cabin. This specimen is not quite adult, but agrees with specimens of *kadiacensis* of the same age in size, color, and cranial characters. Its flesh measurements are as follows: Total length 326; tail vertebrae 91; hind foot 45.

***Putorius rixosus* Bangs.** Bangs Weasel.

One adult female was taken in a swampy place near Tyonek September 19. It was caught in a small mouse trap in a *Microtus* runway and doubtless would have escaped had it not thrashed into a pool of water and drowned. This specimen differs but very slightly from the type of *rixosus*, and shows no definite approach to subspecies *eskimo*. The color of the upperparts is uniform vandyke brown, slightly darker than the type of *rixosus*; the tail is the same color, with a faint paleness on the underside and no trace of black anywhere; the under

parts, including the under and inner sides of the forelegs and the forefeet, are pure white; the toes and one-third of the hind feet are white. The skull of the Cook Inlet specimen is about the same size as that of the type of *rixosus*; the braincase is slightly flatter and more elongate; the teeth are identical. The flesh measurements are as follows: Total length 165; tail vertebrae 18; hind foot 21. Skull: Basal length 27.5; palatal length 10.8; zygomatic breadth 14; breadth across post-orbital processes 9; length of audital bullæ 10.

The natives regard the capture of one of these rare animals as a piece of great good fortune. One old Indian who frequently visited our cabin told us that his brother who had caught one when a small boy had in consequence become a 'big chief;' and he assured me that since I had caught one I must surely be destined to become a man of great wealth and power.

***Mustela americana* Turton. American Marten.**

Martens are only moderately common. George Coon, a reliable trapper of Hope, told me that in a season of about two and one-half months in 1899, near the mouth of Turnagain Arm, he took but 15 martens. Two marten skulls in the Biological Survey collection, collected by Dall De Weese on the Kenai Peninsula, are not referable to either *M. a. caurina* or *M. a. actiosa*, but seem to be very nearly like typical *americana*. The skulls and teeth are about the same size as in *americana* from the Adirondack Mountains, New York, and the shape of the last upper molar also agrees with that of *americana*, being of almost equal width internally and externally.

***Gulo luscus* (Linnæus). Wolverine.**

Apparently rather common, as a number of skins are said to be secured annually. All of these are shipped via St. Michael to trading posts on the Yukon River, where they are sold to the Yukon natives, who value them very highly for making trimmings for their fur clothing. The natives and older prospectors tell many stories of the wolverine's skill and cunning in discovering and securing caches of provisions.

***Sorex personatus* Geoffroy. Common Shrew.**

Very common at both Hope and Tyonek. Twenty specimens were taken in the vicinity of Hope and 19 at Tyonek. These are smaller and lighter colored than topotypes of *streator* from Yakutat, but can hardly be referred to *arcticus*. I have not been able to find any characters in which they differ from *personatus* of the eastern United States. The measurements of 20 Cook Inlet specimens average as follows: Total length 101; tail vertebrae 40; hind foot 12.

Sorex alascensis shumaginensis Merriam. Shumagin Shrew.

Sorex alascensis shumaginensis Merriam. Proc. Wash. Acad. Sci., II, 18, Mar. 14, 1900.

Seventy-six specimens of a shrew almost indistinguishable from *S. shumaginensis* were taken, 27 near Hope and 49 near Tyonek. These are slightly smaller than *S. alascensis* and decidedly paler colored, thus approaching *S. shumaginensis*. They do not show as much light peppery spotting as *shumaginensis*, but otherwise do not differ from it. The skulls are slightly smaller than those of *alascensis* and practically identical with those of *shumaginensis*.

Sorex (Microsorex) eximius,¹ sp. nov.

Type from Tyonek, Cook Inlet, Alaska. ♀ ad. No. 107126, U. S. National Museum, Biological Survey collection. Collected September 14, 1900, by W. H. Osgood and E. Heller. Orig. No. 1395.

Characters.—Similar to *Sorex hoyi*, but larger and paler colored; skull widely different.

Color.—Head, back, and sides uniform pearly sepia, slightly paler than in *S. hoyi*; underparts pale drab, not strongly contrasted with upperparts; tail bicolor.

Skull.—Rostrum and interorbital region narrow and elongate; braincase much higher than in *S. hoyi* and more compressed anteriorly, distinctly elevated above plane of rostrum; palate long, narrow, and excavated. Mandibles longer and relatively more slender than in *S. hoyi*. Dentition much heavier than in *S. hoyi*; relative size of fourth unicuspid, as compared with first and second, quite small; inferior cusp of first upper incisor long and slightly decurved.

Measurements.—Type: Total length 98; tail vertebræ 31; hind foot 11. Skull: Basal length (inferior lip of foramen magnum to front of middle incisors) 15; palatal length 6.5; mastoid breadth 7.1; antorbital breadth 4.3.

Remarks.—The specimen which is the basis of the foregoing description is the only one of its kind among nearly 150 shrews caught at Hope and Tyonek. It is of extreme interest, not only as representing a very distinct new species, but as the only specimen of the subgenus *Microsorex* recorded from Alaska. Its dentition is essentially as in the only other species of the subgenus, *Sorex hoyi*, but the form of its skull is entirely different and much more like the general type found in the subgenus *Sorex*.

Myotis lucifugus (Le Conte). Little Brown Bat.

A few bats were seen at Hope, but no specimens were secured.

¹ Eximius=excellent, extraordinary.

BIRDS OF THE COOK INLET REGION.

Gavia imber (Gunn.). Loon.

An old skin of a loon was seen at Hope; otherwise the species was not observed by us.

Gavia lumme (Gunn.). Red Throated Loon.

Five specimens of '*Colymbus septentrionalis*' are recorded in the catalogue of the National Museum among Bischoff's birds from Fort Kenai. I have been unable to find any of these in the National Museum.

Uria troile californica (Bryant). California Murre.

Bean records specimens taken at Chugachik Bay (= Kachemak Bay) June 30, 1880, and reports the species as abundant;¹ and a specimen taken by George Palmer at Knik Station is in the National Museum. The species was not seen by us in August and September.

Stercorarius parasiticus (Linn.). Parasitic Jaeger.

Several were seen at Homer August 22. Not seen elsewhere about the inlet.

Rissa tridactyla pollicaris Ridgw. Pacific Kittiwake.

A few were seen at Homer August 22. Not noticed elsewhere in the inlet.

Larus sp.

A few large gulls in immature plumage were occasionally seen, but they were noticeably uncommon. This scarcity I found was due to the fact that for the past two years gulls have been systematically slaughtered for millinery purposes. A trader offered from 10 to 20 cents each for them, and consequently the Indians and half-breeds have killed every one that has come within range of their guns.

Larus philadelphia (Ord). Bonaparte Gull.

Seen in considerable numbers at Homer August 22, but not elsewhere about the inlet.

Sterna paradisæa Brünn. Arctic Tern.

The National Museum catalogues show that Bischoff secured 4 specimens of this species in May and June, 1869. We did not meet with it.

Diomedea albatrus Pallas. Short-tailed Albatross.

In the summer of 1880 Dr. T. H. Bean found this species common about the mouth of Cook Inlet, and a specimen was secured near Fort

¹Proc. U. S. Nat. Mus., V, 172, 1882.

Alexander. We did not see it when we were in this vicinity, in August and September, 1900.

Phalacrocorax pelagicus Pallas. Pelagic Cormorant.

A single, lonely-looking cormorant was several times seen at Tyonek flying up the inlet close to the shore. Others were seen at Homer.

Anas boschas Linn. Mallard.

Common at Tyonek, where 7 immature birds of the year were shot by E. Heller in September.

Dafila acuta (Linn.). Pintail.

A specimen was taken by Bischoff at Fort Kenai.

Aythya marila nearctica Stejn. American Scaup Duck.

A flock of 6 scaup ducks was seen on a pond near Tyonek September 17.

Somateria v-nigra Gray. Pacific Eider.

A young bird and four eggs were secured by Dr. T. H. Bean at Chugachik Bay (=Kachemak Bay) July, 1880.

Oidemia perspicillata (Linn.). Surf Scoter.

Several flocks of scoters supposed to be this species were seen at Homer August 22. A specimen was taken by Bischoff at Fort Kenai July, 1869.

Branta canadensis subsp? Canada Goose.

Small flocks were frequently seen at Tyonek, but no specimens were secured.

Olor columbianus (Ord). Whistling Swan.

The miners about the inlet say that swans are often seen there and that several have been killed.

Ardea herodias Linn. Great Blue Heron.

A great blue heron was seen at Hope by E. Heller.

Grus canadensis (Linn.). Little Brown Crane.

Immense flocks of migrating cranes are said to pass over Cook Inlet annually. Three specimens were taken at Fort Kenai by Bischoff.

Phalaropus lobatus (Linn.). Northern Phalarope.

Six specimens were taken by Bischoff at Fort Kenai May, 1869.

Gallinago delicata (Ord). Wilson Snipe.

One specimen was taken by Bischoff at Fort Kenai May 5, 1869.

Macrorhamphus griseus scolopaceus (Say). Long-billed Dowitcher.

Four specimens were taken at Fort Kenai May 4-9, 1869, and one July 20, 1869. Two of these are still in the National Museum.

Tringa couesi (Ridgw.). Aleutian Sandpiper.

An Aleutian sandpiper was seen on the beach near Homer August 22.

Tringa bairdi (Coues). Baird Sandpiper.

A sandpiper, thought to be this species, was seen at Homer August 22.

Tringa alpina pacifica (Coues). Red-backed Sandpiper.

One specimen taken at Fort Kenai by Bischoff May 16, 1869.

Ereunetes occidentalis Lawr. Western Sandpiper.

Three specimens were taken at Fort Kenai by Bischoff May 12-16, 1869. One of these (No. 58470) has been examined; it is perfectly typical of the large-billed form, *occidentalis*.

Limosa hæmastica (Linn.). Hudsonian Godwit.

Nine specimens were taken by Bischoff at Fort Kenai. At least two of these are still in the National Museum—one an adult in breeding plumage, the other in fall plumage.

Totanus melanoleucus (Gmel.). Greater Yellow-legs.

Taken at Fort Kenai by Bischoff May and June, 1869; specimen still in National Museum.

Actitis macularia (Linn.). Spotted Sandpiper.

Several were seen along Resurrection Creek near Hope, and one was taken.

Numenius hudsonicus Lath. Hudsonian Curlew.

A specimen was taken by Bischoff at Fort Kenai May 18, 1869, but can not now be found in the National Museum.

Squatarola squatarola (Linn.). Black-bellied Plover.

One taken by Bischoff at Fort Kenai May 6, 1869; specimen examined in National Museum.

Canachites canadensis osgoodi Bishop. Alaska Spruce Grouse.

'Black grouse' or 'fool hens,' as they are locally termed, are very common in all the Cook Inlet region. They are easily killed, and many thus find their way to the miner's frying pan. The Indians and half-breeds also hunt them to a considerable extent. When flushed from the ground, they rise quickly and fly swiftly, but only to light in the nearest spruce. When this is but a few yards away, they immediately flounder into the thickest part of it; but if a long stretch of

birches, poplars, or small deciduous bushes intervenes, they continue winding in and out until they reach the requisite spruce. In September at Tyonek they were often found in small flocks of eight or ten individuals. When flushed each would betake itself to a separate tree and after a brief interval start a subdued clucking, so that all could be easily located. At Hope they were found ranging from sea level to timberline; on one occasion I flushed a flock of grouse and but a short distance farther on a flock of ptarmigan. Their crops were usually found to contain spruce needles and *Vaccinium* and *Viburnum* berries, and in one case heads of *Equisetum*. Cook Inlet specimens agree perfectly with typical *osgoodi* from the Yukon Valley.

Lagopus rupestris (Gmelin). Rock Ptarmigan.

A few small flocks were seen in the mountains on the north side of Bear Creek, and three females were taken. They have been hunted more or less by the miners in this vicinity, and we found them very wild and hard to secure.

Lagopus leucurus Swains. & Rich. Northern White-tailed Ptarmigan.

While setting small mammal traps in a few patches of grass at the extreme head of Bear Creek September 5, I suddenly became aware of a subdued clucking apparently from a rockslide not far away. Upon following up the sound I was soon able to distinguish some gray birds moving over the rocks, but so closely did they resemble the background that I could not see them unless they moved. They were quite tame and allowed me to approach within a few yards, so that I was easily able to make out an old female white-tailed ptarmigan and a brood of seven nearly full-grown young. The old bird was almost as solicitous for her charges as if they had been downy chicks, and led them away very adroitly, keeping up a continuous purring cluck and making herself as conspicuous as possible. Although evidently much alarmed at my presence, flight as a means of escape did not seem to enter their heads, and it was not until I fired on the old bird that the young took wing. I had only my rifle with me, and so was obliged to shoot the ptarmigan with a load intended for bear, but fortunately the bird was not irreparably mutilated and I was able to make a fairly good specimen of it. This specimen was found to be different from the white-tailed ptarmigan of the Colorado mountains, and examination of the original description of *Lagopus leucurus* showed that the northern bird was the one originally described by Swainson.¹

Circus hudsonius (Linn.). Marsh Hawk.

One was seen flying back and forth near Homer over a meadow thickly populated with *Microtus*. Another was seen at Hope.

¹ Cf. Auk, XVII, 180, April, 1901.

Accipiter atricapillus striatulus Ridgw. Western Goshawk.

Goshawks were frequently seen near Tyonek, and two immature birds were taken September 18. Remains of *Sciurus* were found in their craws.

Haliaetus leucocephalus alascanus Towns. Alaska Bald Eagle.

Said to occur; not seen by us.

Falco columbarius Linn. Pigeon Hawk.

Rather common; several were seen at Hope and also at Tyonek. An immature bird was shot by E. Heller at Hope August 30. Its craw contained parts of crossbills.

Bubo virginianus saturatus Ridgw. Dusky Horned Owl.

Very common; they were heard nightly at Hope and occasionally at Tyonek. One was seen on a dark day in the deep birch woods back of Tyonek and an adult female was shot at Hope August 30. A specimen taken by George Palmer at Knik Station is in the National Museum. These two specimens are quite different from typical *saturatus*, but they are nearer to it than to any other described form. They are considerably lighter than *saturatus* and do not have barring extending down on the feet to the toes, as is usual in that form; also the bars on the sides are not blended, but separated by distinct light areas.

Nyctea nyctea (Linn.) Snowy Owl.

The miners and traders about Cook Inlet say that snowy owls have frequently been killed there in winter.

Ceryle alcyon (Linn.) Belted Kingfisher.

Common along streams. Its loud, clattering cry was heard frequently along Resurrection Creek, near Hope, when the thick growth of trees and shrubs prevented seeing the bird.

Picoides americanus fasciatus Baird. Alaska Three-toed Woodpecker.

Represented by eight specimens as follows: Hope, four; Tyonek, one; Fort Kenai, three. It was found to be quite common in the Turnagain Arm region, but at Tyonek, where coniferous trees are scarcer, only one bird was seen. Three specimens taken by Bischoff at Fort Kenai in 1869 are in the National Museum.

Selasphorus rufus (Gmelin). Rufous Hummingbird.

Mr. T. W. Hanmore, who has been stationed at Tyonek for eleven years, says that he has seen humming birds there several times. This is doubtless near the limit of the range of the species, as the bird has not been recorded farther north.

Contopus borealis (Swains.). Olive-sided Flycatcher.

A specimen from Fort Kenai is in the National Museum. It is an adult male taken by Bischoff May 26, 1869.

Pica pica hudsonica (Sab.). American Magpie.

The miners at Sunrise City told us that magpies had been seen in that vicinity frequently, but we did not observe them there or at any other point in the inlet. Specimens taken in Graham Harbor by C. H. Townsend in 1892 are in the National Museum.

Cyanocitta stelleri (Gmelin.). Steller Jay.

Several specimens taken at Graham Harbor in 1892 by C. H. Townsend and B. W. Evermann are in the National Museum. This is apparently the northern limit of the species, as we did not find it farther up the inlet in Turnagain Arm, nor on the north side at Tyonek.

Perisoreus canadensis fumifrons Ridgw. Alaska Jay.

Occasionally seen. One morning, after a light fall of snow, a small party of jays visited our camp in the mountains near Hope. A few were also seen at Tyonek. A large series was taken by Bischoff at Fort Kenai.

Corvus corax principalis Ridgw. Northern Raven.

Only moderately common. The trappers say they are very abundant in winter and a great nuisance to them, since they systematically spring their traps or take the bait from them.

Scolecophagus carolinus (Müller). Rusty Blackbird.

Two males were shot by Heller at Tyonek September 23. No others were seen during our stay, but the birds undoubtedly breed in the vicinity, for two specimens were taken by Bischoff May 28 and July 4, respectively. An examination of the material in the National Museum shows a slight difference in size between eastern and western birds of this species. The bill especially is constantly a trifle shorter and lighter in specimens from Alaska.

Loxia curvirostra minor (Brehm). American Crossbill.

A specimen taken at Graham Harbor in 1892 by C. H. Townsend and B. W. Evermann is in the National Museum.

Loxia leucoptera Gmelin. White-winged Crossbill.

Common. They were not seen in large flocks, however, but generally in pairs. Four specimens were taken at Hope August 25-28.

Acanthis linaria (Linn.). Redpoll.

Large flocks were seen frequently both at Hope and Tyonek, and one immature specimen was taken at Hope. Two summer adults are

in the National Museum, one taken by Bean at Chugachik Bay (=Kachemak Bay), and one by Bischoff at Fort Kenai.

Spinus pinus (Wilson). Pine Siskin.

Three specimens were secured from a large flock at Tyonek September 22. They were not seen elsewhere about the inlet.

Calcarius lapponicus alascensis Ridgw. Alaska Longspur.

An adult male in breeding plumage was taken by Bischoff at Fort Kenai in May, 1869.

Ammodramus sandwichensis alaudinus (Bonap.). Western Savanna Sparrow.

Evidently an abundant breeder, as numerous specimens were taken in summer by Bischoff and Bean at Fort Kenai and Chugachik Bay. At the time of our work in August and September very few were seen. Four specimens were taken, three at Hope August 26, 28, and 29, respectively, and one at Tyonek September 18.

Zonotrichia leucophrys gambeli (Nutt.). Intermediate Sparrow.

Evidently a common breeder, as Bischoff took a number of specimens at Fort Kenai in May, 1869, at least one of which is still in the National Museum. The species was not observed by us, but it may have been overlooked among the immature birds seen at Hope and all supposed to be *Zonotrichia coronata*.

Zonotrichia coronata (Pallas). Golden-crowned Sparrow.

Common in the low second-growth brush about the village of Hope; also occasionally seen in the mountains near there. Four birds collected by Bischoff at Fort Kenai are recorded in the National Museum catalogue as *Zonotrichia querula*. None of these are now at hand, but the entries doubtless refer to *Z. coronata*.

Spizella monticola ochracea Brewst. Western Tree Sparrow.

A specimen is recorded taken by Bischoff at Fort Kenai May 19, 1869, but it can not now be found in the National Museum. As the occurrence of the species is altogether probable, however, there seems no reason to doubt the identification.

Junco hyemalis (Linn.). Slate-colored Junco.

Common. Three specimens were taken at Hope August 26-28.

Melospiza melodia kenaiensis Ridgw. Kenai Song Sparrow.

The type of this subspecies was taken by C. H. Townsend at Port Graham on the Kenai Peninsula April 9, 1892. Two specimens were also taken at this locality by Dr. Bean July 4, 1880. A specimen

taken at Hope August 26 differs from the type of *kenaiensis* to such a degree that it hardly seems possible that it merely represents the difference between fall and summer plumage. It is characterized by very sooty coloration; the dark markings about the head, neck, and breast are very intense and the streaks on the back are very prominent. In size it is intermediate between *kenaiensis* and *caurina*, and as no fall specimens of either are at hand it seems best to refer it to *kenaiensis*, which is geographically near. It measures as follows: Wing 74; tail 70; exposed culmen 14; bill from nostril 10; tarsus 24.5.

***Melospiza lincolni* (Aud.). Lincoln Sparrow.**

An adult male was taken at Hope August 28, and a few others were seen while we were there. The specimen taken shows none of the characters attributed to *Melospiza lincolni striata*.

***Passerella iliaca annectens* Ridgw. Yakutat Fox Sparrow.**

Rather common, but very shy, as usual, and hard to secure. Two specimens were taken at Hope and one at Tyonek. These seem to be intermediate between *P. i. annectens* and *P. i. insularis*, as they have the smaller bill and more dusky underparts of *annectens* and the lighter upperparts of *insularis*.

***Lanius borealis* Vieill. Northern Shrike.**

An immature bird in the brown plumage was shot by E. Heller at Hope September 6. Several were seen near Homer. An adult from Fort Kenai, collected by Bischoff, is in the National Museum. At present I am unable to find sufficient characters to warrant use of the name *invictus*¹ for these birds. The question is further complicated by *Lanius borealis sibiricus*, which, judging from three specimens in the National Museum, differs from Alaskan birds only in having the vermiculations on the breast nearly obsolete.

***Helminthophila celata lutescens* (Ridgw.). Lutescent Warbler.**

Three specimens taken by Bischoff at Fort Kenai May 22-26, 1869, are still in the National Museum. Examination shows them to be typical *lutescens*.

***Dendroica coronata* (Linn.). Myrtle Warbler.**

The National Museum catalogue records this bird taken at Fort Kenai by Bischoff.

***Dendroica striata* (Forster). Black-poll Warbler.**

One specimen was taken at Fort Kenai by Bischoff, but is not now to be found.

¹Grinnell, Birds of Kotzebue Sound, Pac. Coast Avifauna, I, 54-55, Nov., 1900.

Anthus pensilvanicus (Latham). American Pipit.

Comparatively few pipits were seen. One specimen was taken at Tyonek September 18.

Cinclus mexicanus Swains. American Dipper.

Several were seen in the mountains near Hope, and a specimen was taken there September 3.

Certhia familiaris montana Ridgw. Rocky Mountain Creeper.

An adult female taken at Hope August 31 is in fine fall plumage and typical of this subspecies. A few individuals were seen at Tyonek.

Parus atricapillus septentrionalis (Harris). Long-tailed Chickadee.

Very common both about Turnagain Arm and at Tyonek. An adult male was taken at Hope September 5. This specimen seems to be referable to *P. a. septentrionalis* rather than to *P. a. turneri*.

Parus hudsonicus Forster. Hudsonian Chickadee.

Very common at Tyonek, but rarely seen at Hope. Two specimens were taken at Fort Kenai by Bischoff. Cook Inlet specimens do not seem to differ from those of the Yukon and Kowak valleys. I am also unable to find any appreciable differences between them and three birds recently collected by E. A. Preble near the type locality of *hudsonicus*. Consequently I do not agree that the specimens at present available warrant the recognition of *Parus hudsonicus evura*.¹ From a rather hasty examination of the material in the National Museum there seems to be an average difference in the length of the tail between the Alaska birds and the birds from the extreme northeastern United States. The birds from the west side of Hudson Bay, however, are intermediate and apparently nearer to the Alaska birds. In other words, as far as present material goes, there are just as good grounds for the recognition of *Parus hudsonicus littoralis* Bryant, 1863, from Nova Scotia, as for *P. h. evura* Coues, 1884, from Alaska.

Regulus satrapa olivaceus Baird. Western Golden-crowned Kinglet.

Moderately common.

Regulus calendula (Linn.). Ruby-crowned Kinglet.

An adult male taken by Bischoff at Fort Kenai May 9, 1869, is in the National Museum. Examination of this specimen does not show any characters that approach those of *Regulus calendula grinnelli*, which is found on the coast only a short distance farther south.

[Hylocichla aliciae (Baird). Gray-cheeked Thrush.

This is one of the entries in the Bischoff collection from Fort Kenai. The specimen has not been found in the National Museum collection,

¹ Cf. Rhoads, Auk, X, 331, 1893, et Bishop, Auk, XVII, 118-119, 1900.

and as the possibility of misidentification is considerable, the species is not unequivocally admitted to this list.]

Hylocichla ustulatus almæ Oberholser. Alma Thrush.

Two male birds in fresh fall plumage were taken at Hope August 26 and August 29, respectively. These are very olivaceous on the upperparts and agree with a bird taken at Circle City August 18, 1899.

Hylocichla aonalaschkæ (Gmelin). Dwarf Hermit Thrush.

Two specimens were taken at Hope and Tyonek September 7 and September 14, respectively. These are in fresh fall plumage, and are somewhat more olivaceous than fall birds from Kadiak.

Merula migratoria (Linn.). Robin.

The miners that we met at Hope and Sunrise reported that the 'regular eastern robin' had often been seen there. We did not observe it ourselves in the month of August, the time of our stay at those points.

Hesperocichla nævia (Gmelin). Varied Thrush.

Not abundant; occasional individuals were seen or heard.

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